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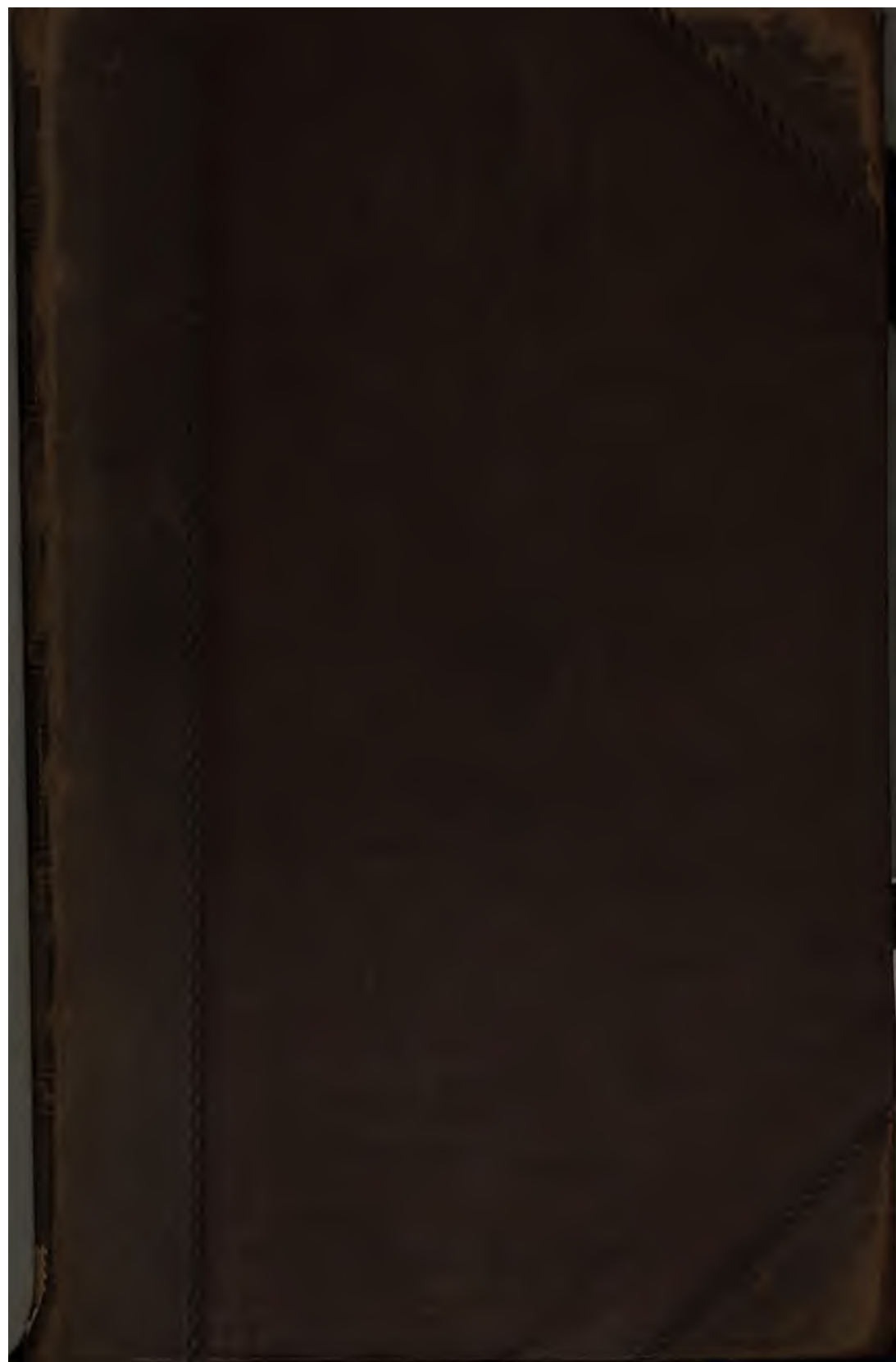
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GENERAL VIEW
OF THE
AGRICULTURE
OF THE
COUNTY OF ARGYLL;

WITH
OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT.
Drawn up for the Consideration of the
BOARD OF AGRICULTURE AND INTERNAL IMPROVEMENT,

BY JOHN SMITH, D. D.
ONE OF THE MINISTERS OF CAMPBELTON.

ARGYLL! thou ancient seat of ALBIN's kings,
Whose warlike sons withstood the Roman arms,
Subdued the Picts, and spurn'd the yoke of Dance;
Long may thy hardy hospitable race
Enjoy their mountains and sequester'd vales
In rural innocence! thy pastures clad
With herds and fleecy flocks, thy winding glens
With yellow corn, thy hills with waving woods,
Thy bounteous seas with all the finny tribes:
—If more be needful, let thy frugal sons
Ply well the plough, the shuttle, and the sail,
The source of wealth, of elegance and ease.

EDINBURGH:

PRINTED BY MUNDELL & SON;

SOLD BY G. NICOL, Pall Mall, London, Bookseller to His Majesty,
AND THE BOARD OF AGRICULTURE; AND BY MESSRS. ROBINSON, PA-
TER NOSTER ROW; J. SEWELL, CORNHILL; CADELL & DAVIES, STRAND;
WILLIAM CREECH, EDINBURGH; AND JOHN ARCHER, DUBLIN.

1798.

ADVERTISEMENT.

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Gentlemen wishing to have this Map without the SURVEY, may be supplied therewith at 3s. 6d. ; or at 7s. 6d. on Canvas and Rollers.

EDINBURGH, }
22d Jan. 1798. }

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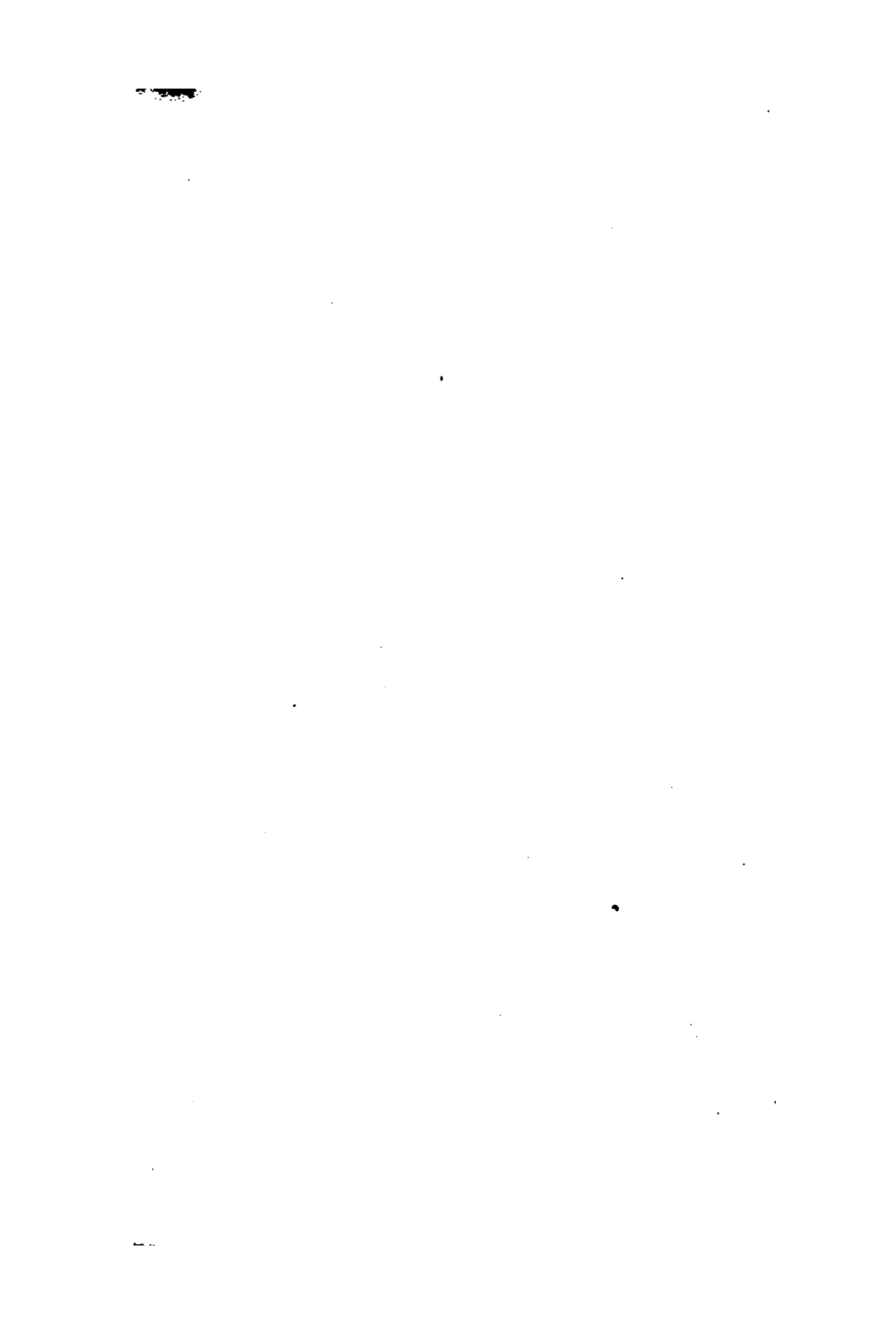
2.—Sheep.

3.—Horses.

4.—Hogs.

5.—Rabbits.

6.—Poultry.



chan ($1^{\circ} 39'$, at the rate of $69\frac{1}{2}$ statute miles to the degree of lat.) is 115 miles; and its greatest breadth, reckoning $33\frac{1}{2}$ miles to the degree of longitude (which corresponds to the medium lat. of 56°) is above 68 miles.

On the two sides, which border on the sea, the land is everywhere indented with deep bays and creeks, winding in a variety of directions, so as to form the whole county into a number of peninsulas, and to afford a variety of safe harbours. Some of these bays run so far into the country, that only one of 27 parishes is altogether inland. The extent of sea shore which bounds the continent of Argyle, from the head of Lochlong round to the point of Ardnamurchan, is supposed to exceed 600 miles. By this advantageous disposition, the county has all the advantages of an insular situation, without any of its inconveniences.

As there is no particular map of the county, its dimensions cannot be exactly ascertained. If we cut off the peninsula of Kintyre, which is 40 miles long, by $6\frac{1}{2}$ at a medium breadth (making 260 square miles), the remaining continent, which is 75 miles in length, may be taken, it is thought, at the average breadth of 33 miles, which, added to Kintyre, will make the whole continent 2735 square miles. The islands connected with the county, are supposed to make about 1063 miles more; so that the whole county, by this computation, will be 3800 square miles*.

By a calculation which lately appeared in the public papers (and which was ascribed to Sir John Sinclair), Scotland is made to contain 26,369,695 English acres, or 41,202 statute square miles; and England 46,915,953 acres, or 73,306

* See the Statistical Table, in C. XVII. A map of the county is expected soon from Mr. Langlands, land-surveyor to the Duke of Argyle; by which its exact dimensions will be better known. In the mean time, the writer thought it better to hazard the above conjecture, than to be altogether silent upon the subject.

square miles; so that, by the above computation, Argyleshire is about 1-11th of Scotland, and about 1-30th of Great Britain*.

This extensive county constituted nearly the whole of the Scottish kingdom, from the reign of Fergus, the son of Erc, till the Picts were subdued by Kenneth MacAlpine; *i. e.* from the year 503 to the year 843; and is the only part of the kingdom in which the Aboriginal Scots (or *Albanich*) always retained a footing, and preserved a seed to the nation.

SECT. II.—*Divisions.*

THE continent of Argyle, which consists of 25 parishes (including the islands connected with some of them), and a part of two more, connected also with Invernessshire, is divided, in the county books, into the districts of Kintyre, Cowal, Argyle, and Lorn; except the parish of Morven, Ardnamurchan, and part of Kilmalie, which lie in the district of Mull. Supposing the whole to contain 2735 square miles, or 1,367,500 Scotch acres†, it is computed, that of these

1,213,500 acres may be heath, hill, and pasture;
 100,000 do. arable;
 30,000 do. wood;
 24,000 do. fresh water lakes, and rivers.

* According to Templeman's Survey, Argyleshire is only 2492, Scotland 27,794, and England 49,450 geographical square miles. This calculation makes them all about a third less than the above, and nearly in the same proportion to each other. But as Dr. Grew (*Philos. Trans. Abridg. IV. 449.*) seems to have geometrically demonstrated, that England contains 46,080,000 statute acres, which nearly coincides with Sir John's account, there is reason to believe, that the statements in the text are not far from the truth; and that Templeman's calculation, after making the proper allowance for the difference between geographical and statute miles, is by far too low.

† The Scotch acre contains 6150 square yards, the English acre 4840; so

The proportion of the arable to the other grounds, as stated above, is nearly as 1 to 12, being about a 13th of the whole. To an eye that takes but a superficial view of the face of the country, this proportion of arable will appear to be too great: But the eye is very apt to be deceived in judging of the proportion between hills and plains. To make a just comparison in this case, one must form the idea of a plain extended through the base of the hill, and compare in his mind the extent of such a plain with that which he has in view. The surface of a mountain may measure many times the extent of such a horizontal plain as it stands upon, but cannot in fact contain more trees or piles of grass than would grow on such a plain, if indeed so many*.

The above proportion of arable to other lands cannot be supposed too high, when it is considered that Kintyre, which, in point of extent, is little more to the rest of the continent than as 1 to 10, contains of itself above 29,000 acres of arable land, computing the smaller part, that has not been surveyed, at the same rate with that which was actually measured. The proportion of arable over all will not appear to be too highly rated, when it is considered that this is more than a fourth part of it. How much of our waste grounds may be capable of being improved by tillage, planting, and watering,

that the proportion between them is nearly as 5 to 4. In a statute square mile there are 500 Scotch, or 640 English acres. The Scotch Gunter chain is 24 4-5th yards in length, and consists of 100 links, each 8.928 inches. Ten chains in length, and one in breadth make an acre.

* In measuring steep or hanging grounds, so many links should be subtracted from every chain, according to the several degrees of declivity, in order to convert the hypotenuse into a base, and come at the true measurement; at the following rates:

Deg.	Links.	Deg.	Links.	Deg.	Links.	Deg.	Links.	Deg.	Links.
4.05	1-4th	8.11	1	16.26	4	21.565	7	25.84	10
5.73	1-half	11.48	2	18.195	5	23.074	8	27.13	11
7.02	3-4ths	14.07	3	19.95	6	24.495	9	28.36	12

will fall to be considered, under these different heads, afterwards.

SECT. III.—*Climate.*

THE climate of the lower and more southern parts of this county differs greatly from that of the higher and more northern parts of it. The lower parts are everywhere so much surrounded and indented by the sea, that the atmosphere is mild and temperate*. Frost seldom continues long, and snow lies rarely above two or three days at a time upon the sea-coast. But the upper and northern parts, elevated far above the level of the sea, and bordering on the Grampian Hills, are subject to a severer atmosphere. These lofty mountains are generally covered with snow for a great part of winter, by which the air is chilled to a considerable distance. The valleys, however, among these mountains are not, even in that inclement season, so cold or uncomfortable as might be supposed from the general aspect of the country. Most of them are low and winding, and derive a great deal of shelter from the surrounding mountains. Most of them also look to the south or south-east; and as the wind blows for the greater part of the year from the west and north-west, these high mountains, which generally stand in that direction, serve as a screen to ward off its blasts.

The climate, in different parts of the county, is no less different in respect of wet and dry. The clouds wafted from the Atlantic Ocean, and breaking on the tops of the higher mountains, occasion much more frequent rains in the upper than in the lower parts along the sea-coast. Of these rains we are apt to complain, without considering that our moun-

* In Kintyre the frost is seldom so intense as to sink the thermometer 8 degrees below Fahrenheit's freezing point.

tains, now covered with grafs and verdure, would without them be barren and unfruitful.

The quantity of rain which falls yearly in any part of the county has not yet been ascertained; but it is believed that, at an average, it is not much more than what falls on the banks of the Clyde (about 32 inches), as the crops there are saved later, and generally with more difficulty, than with us; so that our climate, though certainly better adapted for grafs and green crops than for corn, cannot be deemed very unfavourable to cultivation. Mildews, blights, and hoar-frosts, so hurtful to crops in some other parts of Scotland, are seldom known to do much harm here.

The climate however is, upon the whole, rather moist, and extremely variable; and the transitions from hot to cold, and from dry to wet, frequently sudden, and almost instantaneous. The sudden checks thus given to perspiration have rendered consumptive complaints and rheumatisms rather common, since linens have been used instead of flannels, which are certainly better adapted to such a climate. The general complexion of the people, however, is remarkably healthy; and instances of extreme old age are not unfrequent.

SECT. IV.—*Soil and Surface.*

THE general appearance of this county is rough and mountainous, especially in the more northern parts of it, where, as already observed, it borders on the Grampian Hills. There Alps piled on Alps hide their heads in clouds, and the face of nature wears a wild magnificence. Even along the sea-coast, where the land is generally lower and more level, there are some mountains of stupendous size and height. Cruachan, washed on one side by the sea, and on the other by Lochow, is 1130 feet high, and above 20 miles in circum-

ference. The most mountainous parts of the county, however, are interspersed with beautiful and fertile vales, along the margin of whose streams there is generally a considerable quantity of arable and improveable ground, though rarely in so great a proportion as along the sea-coast.

The soil of the arable land is extremely various. The most common along the sea and rivers is a light loam mixed with sand or gravel, on a clay or gravelly bottom. On the sides of the hills, the most common is a light gravelly soil, on a till bottom. Sometimes the soil of the lower grounds has a mixture of clay, and sometimes of moss; and not seldom it is a coat of black mossy earth lying on till. As our mountains consist chiefly of whinstone, the lower grounds must of course contain a considerable proportion of the particles of that stone, which since the creation have been continually washed down from the higher to the lower grounds. The greatest defect of the soil in general is the want of a due proportion of clay, to give it the proper degree of tenacity for supporting corn crops. This is commonly the case in all hanging grounds and mountainous countries. The clay washes away, while the gravel and sand remain behind.

The soil of the pasture grounds is no less diversified. Some of it is dry and kindly, and produces a sweet and fine pile of grass; some of it wet and spongy, and covered with coarse grasses, rushes, and sprouts. Some of the flat grounds are marshy, and some mossy; and a very great proportion, both of what is flat and hilly, is covered with heath. The tops of the highest hills are generally bare and barren rocks, the unenvied abode of the ptarmigan, scared only by the scream of the eagle.

SECT. V.—*Water.*

It has been observed already that this county is every-

where indented with arms of the sea. Some of these run from the one extremity of it almost to the other. This form gives it such immense advantages for commerce, fishing, manure, and kelp, as may one day be of more avail to it than all its extent of territory. The value of the herrings caught in Lochfine in the years 1794 and 1795 has been computed at more than 40,000 l. each year; but such great tacks are very uncommon. The quantity of kelp made on the shores of the continent is not so great as that on the shores of islands, from the great quantity of fresh water which mixes with the salt. About 600 tons are supposed to be made annually along the continent of the county. Some of the best kelp has been sold this year as high as 9 l. per ton.

The streams of water are numerous, and some of them pretty large, but none navigable. All of them abound with trout, and many of them with salmon. The salmon fishing of the largest of them (the water of Aw) is let at present for somewhat under 100 l. Some years ago it was let for near twice as much; but of late the quantity of salmon on all this coast is not so great as usual; and this year (1795) it is said that very few of our salmon fishings will pay the expence of the men and materials that attend them.

When manufactures will find their way into this county, many of our streams may be used for turning water-machinery. Almost all of them are capable of being turned to great account in watering land, and cannot fail to be highly prized when that valuable improvement shall be generally introduced. Pearl-shell or water-muscle abounds in many of them; but this is seldom of much account.

The fresh water lakes in this county are numerous, but few of them of considerable extent. Lochow (or Lochaw), the largest of them, is computed to be 24 miles in length, and somewhat less than one of average breadth: a beautiful sheet of water, adorned with islands and ancient castles, and

its banks with corn fields and hanging woods. The only parish in this county which has no sea-shore has this lake running through it. It has also another lake about three miles long. Lochow alone may be nearly equal in extent to all the other lakes in the county. A few of the smaller lakes have not yet been planted with fishes, though this would be a cheap and valuable improvement, equally subservient to the luxury of the rich, and to the necessity of the poor. We might also introduce many kinds of fishes which we yet want.

When lakes are shallow, and easily drained, the sediment at their bottom is found to make excellent arable land. A valuable improvement of this kind was cheaply obtained some years ago at Lochfanish, in the neighbourhood of Campbeltown. Another is nearly effected at Lochan-du'il, in the parish of Kilcalmonel; and those who have property on the banks of Lochow talk of deepening the outlet from it, so as to lower its surface, and enlarge its shores. It is much to the credit of former proprietors that such a project was set on foot, and some progress made in the work, when the acquisition of more territory was of little value in comparison to what it is at present.

Lochow, like Lochnefs, and some other lakes in Scotland, is seldom subject to freezing.—It may be proper to observe under this section that some lakes may be converted to reservoirs for the watering of land.

SECT. VI.—*Minerals.*

WHAT minerals may be in this county, is a matter that has not yet been sufficiently explored. A lead mine has been for a long time wrought on the borders of it near Tyndrom, on Lord Breàdalbin's property*; and another at Strontian†,

* This work has lately intermitted.

† On this above 200 people are employed; the proprietor gets 2-3th of the

on the property of Sir James Riddel. Some appearances of lead ore have been also discovered in Glenurchay, in Appin, and in the parish of Kilmalie*. A copper mine has been found in the parish of Kilmartin, but not so far wrought as to ascertain its value.

It is said that the natives of this county were in use some ages ago to make their own iron; and heaps of iron drofs, or slag, are found in many places among the mountains (then covered with woods) said to be the remains of their founderies. But no iron ore is now observed of so good a quality as to merit any attention; a circumstance rather unfavourable to the tradition.

Coals are found in the neighbourhood of Campbellton, but they have not yet been wrought to any greater extent than what serves the town, which consumes about 4500 tons a year. The coal is rather of an inferior quality. But it is said, that better coal might be got by going deeper, and being at more expence. There is also an appearance of coal in Kenlochalin in Morven, and also in Mull. It is probable, that, in other parts of the county, coal may be also found if properly searched for. The writer was shown a small piece of excellent coal lately dug up by a man casting peats (in Derichulin) in Glenurchay. But whether it got there by some strange accident, or grew in the place, is uncertain, as the spot has not yet been examined†.

Free-stone, of various colours and qualities, is found in Kintyre. There are many other kinds of stone in the county which admit of being dressed and hewn. The most beautiful of them is that of which the Duke of Argyle's castle at Inveraray is

produce, in pigs, free of all charges. The annual produce of the mine at present is about 300 tons.

* A lead mine has been also wrought for some time in the Island of Ilay.

† This circumstance deserves the more notice, that a judicious man from the low country (Mr. Hislop), who had been casting peats here some years ago, used to say, that he suspected there was coal in it.

built, the *lapis ollaris*; said to be the same with that of the king of Denmark's palace at Copenhagen. A stone somewhat similar in colour, but harder and coarser in the grain, is found in Glenurchay, and seems to be the same with that of which the old crosses and monuments in Icolmkill were formed. On this kind of stone, time and the weather seem to make little or no impression; so that it is the fittest of any for monuments.

Elsdale and its neighbourhood abound in slates, of which about five millions have for some time been sold annually, at 25s. per thousand*. A slate quarry is also wrought in Balechelish, in Appin, and there are slate rocks on the estate of Mr. Campbell of Rofs, in N. Knapdale, but not yet wrought.

A kind of granite, which takes such a polish as to resemble spotted marble, is found near Inveraray. A marble quarry has been wrought at Ardmady in Lorn; but the colour, being a dull red streaked with white, rendered it less marketable than it might otherwise have been, and occasioned its being given up, with some loss†. A kind of gray marble is also found on Lochiel's estate in Kilmalie‡. Some more may perhaps be discovered in other parts of the county; though none of them probably will be found so valuable as the beautiful marble of the Island of Tiree.

Limestone, which is of more value than marble, because easier wrought, abounds in most parts of the county, in so much that we may be said to have, not quarries, but almost mountains of it.

* This work employs commonly about 300 men; whose wages amount to above 4000l. a-year. The slate quarry at Balechelish employs about 90. *Statistical Account*.

† It may be proper to observe here, for the sake of those who may not know it, that marble is of the same quality with limestone; so that farmers within reach of the quarry at Ardmady may avail themselves of a vast heap of broken stones and rubbish there prepared to their hand.

‡ A particular description of this marble may be seen in *Mr. Williams's Natural History of the Mineral Kingdom*.

CHAPTER II.

STATE OF PROPERTY.

THE continent of Argyleshire is divided among 156 proprietors. Of the estates of these proprietors

the valued rent of 1	is	nearly	£. 1500
1	—		700
6	from		300 to 200
17	—		200 — 100
20	—		100 — 50
19	—		50 — 30
13	—		30 — 20
37	—		20 — 10
42	under		10
156			

The whole amount of the valued rent of these estates is 9924l. 8s. 1d*. This valuation, according to which the land tax, ministers stipends, schoolmasters salaries, &c. are imposed, was made up in the year 1751, and was at that time half of the real rent, after deducting all public burdens. The number of proprietors at that time was 200; so that they have decreased at the rate of 1 for each year since that period.

* In this, Luing, Seil, Shuna and Kerera are included. The valuation of the other islands, Mull, Iona, Tiree, Coll, Lismore, Jura, Colonsa, Oronsa, Hlay, and Gigha, amounts to 2541l. 17s. 9d. and the number of proprietors in them is 25. Thus, the valued rent of the whole county is 12,466l. 5s. 10d. Sterling; a trifle more than 1-25th of the valuation of all Scotland, which is 3,227,161. 13s. 4d.

The commissioners who took the valuation of this county seem to have done it with great exactness. A landlord in N. Knapdale had a servitude of a *night's lodging* upon one who held of him, for which, in the proof taken of the value of his estate, there is set down "*Item for Cuid-veich, 20s.*"

There were, besides, at that time a very considerable number who held small estates in *wadset*, or mortgage; a species of tenure which is now gone out of use in this county. Such persons held a sort of middle rank between tenants and proprietors.

Till within these 40 or 50 years past, estates were seldom sold in this county. Luxury had not then reached us. Proprietors lived at home, and subsisted chiefly on the gross produce of their own lands. But now the case is otherwise. An expensive mode of living is introduced. Gentlemen resort frequently to the metropolis, and no reproach is attached to the loss of an estate, as the case is become so common. At present a purchaser might find 150,000*l.* worth ready to meet him in the market. This, however, though a private loss, may be a public benefit. A spirit of industry and adventure is excited by the prospect of obtaining one day a spot of one's native land, which he may call his own. The greatest evil which attends the fluctuation of property is, that estates are sometimes bought by strangers, who have no attachment to the country, and who do not reside in it, as did the ancient owners.

The larger estates are managed by factors (or stewards); the lesser by the proprietors themselves, when they reside; and by agents who collect the rent, when they do not reside on their estates themselves.

Of the above 992*l.* 8*s.* 1*d.* of valued rent, above a third part is entailed.

The county sends one member to parliament; and its two boroughs, Inveraray and Campbelton, in conjunction with Ayr, Irvine, and Rothfay, send another.

CHAPTER III.

BUILDINGS.

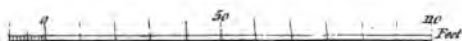
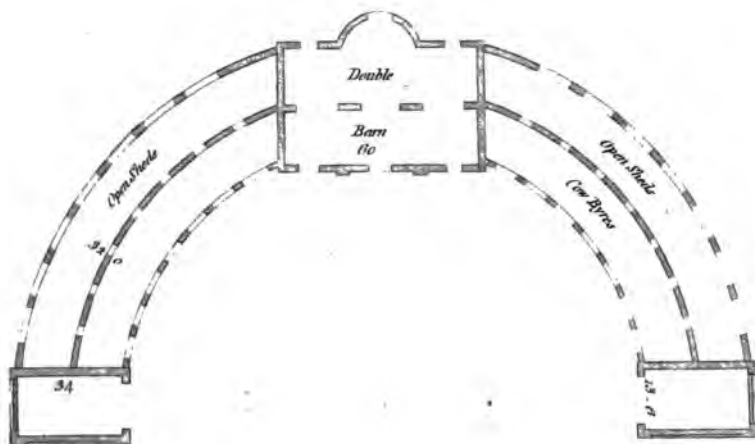
SECT. I.—*Houses of Proprietors.*

MOST of the gentlemen of considerable property in this county have deserted their old family castles, and lodged themselves in neat and elegant modern houses, proportioned to their incomes. Even those of small properties are now generally lodged in slated houses. But the only building that deserves the particular notice of a stranger, is the Duke of Argyle's princely palace at Inveraray.

His Grace has also several sets of elegant offices. A drawing of one of these, which lies in the valley of Glenfhiria, is hereto annexed. Only half of the plan (the uppermost) has as yet been executed. It has been found of great service in so wet a climate, as by means of it hay may be made, or corn dried in a few days, in the midst of rain. The building lies across the valley, and its circular shape occasions a constant draught of air, even in calm weather; as there are open arches opposite to each other through all the building. A few hands serve within to turn over the hay for a few days, when it is perfectly made. The building is divided into two stories, and the upper is the one used for this purpose. In the upper story there are also jointed frames of wood suspended from the roof, at convenient distances from each other. These frames have a number of sharp-pointed pegs on each side of them, inclining upwards; upon each of which a sheaf of corn is hung to dry. The frames, by means of their joints, are lowered down to receive the corn, and when that work is over, they are moved up again, to be out of the way. The floor

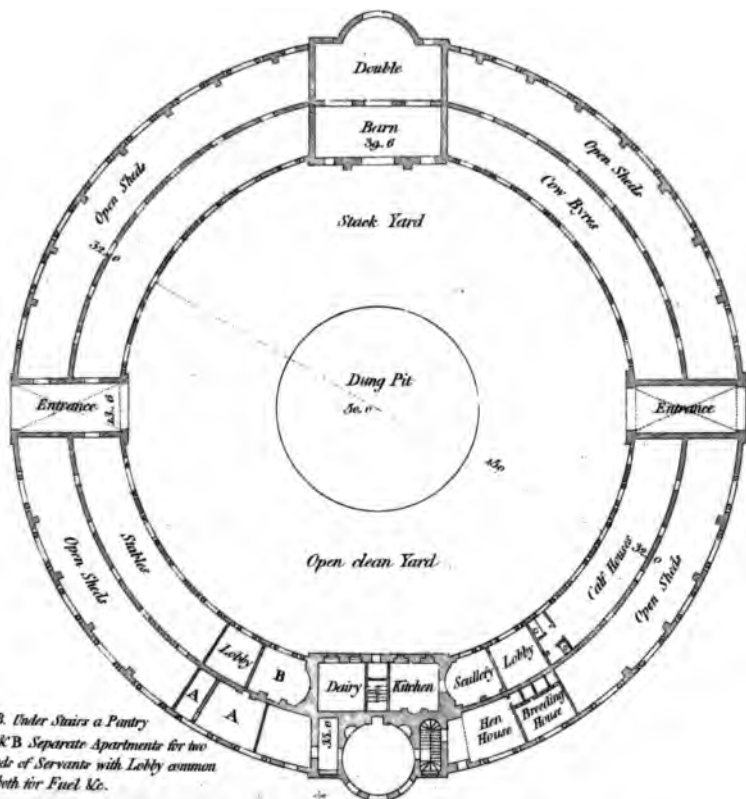
FRONT VIEW OF THE DUKE OF ARGYLL'S BARN
in Glenshire from the South

1797



H. Gough, Edin.

1796.



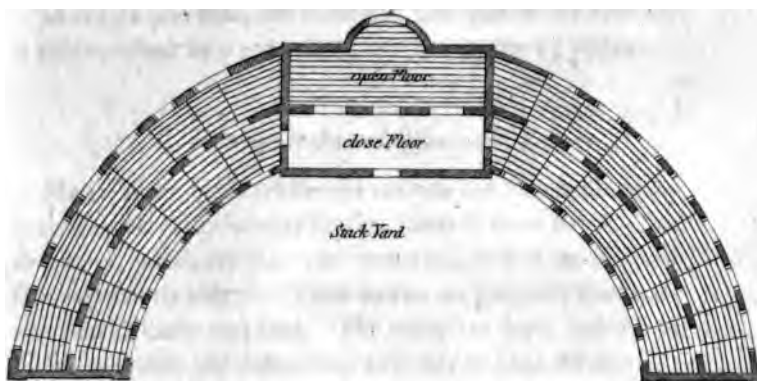
NB. Under Stairs a Pantry
A & B Separate Apartments for two
kinds of Servants with Lobby common
to both for Fuel &c.



A horizontal scale bar with markings at 0, 50, and 100 feet.

R. Sweet Smith

**PLAN of the MIDDLE FLOOR of the BARN & of the UPPER FLOOR
of the SHEDS or WINGS at Maam in Glenshire .**



EXPLANATION

The open Floor which extends over one half of the Barn and over the whole of the Wings, is composed of Battens 5 Inches broad and laid 2 Inches asunder, for the purpose of admitting a circulation of Air. — The Floor of the Sheds is on a level with the bottom or Spring of the Gothic Arches, by which means it receives the Air through them, and also Corn Hay &c. The close Floor in the Barn serves for thrashing. — The whole of the third or upper Floor of the Barn is open, like that of the Sheds and the Half of the middle Floor, & composed of Battens in like manner. — There is a communication by Doors or openings and Steps, betwixt the Barn and the Sheds as represented in the above Plan. — The whole Ground Floor of the Barn is paved with Flags, and the Ground Floor of the Sheds is causewayed.

of the upper story is of boards, about an inch from each other, to receive the benefit of the air from below. The upper story has the openings at a convenient height for receiving the hay or corn from the carts.

In the ground plan, the stone and lime part of the building is distinguished by a red colour, and the timber by yellow.

SECT. II.—*Farm Houses and Offices, and Repairs.*

MANY of the more substantial tenants and storemasters are lodged in very comfortable houses, some of them slated. But the lower, which are the more numerous class of tenants, are still very poorly lodged. Their houses are generally low, narrow, dark, damp and cold. The walls are built sometimes with dry stones, and sometimes with clay or mud for mortar: couples are set about 6 feet asunder; ribs are laid on these couples*; poles or brushwood across these ribs; *divot*, or thin turf, covers these poles; and then the whole is covered with a coat of thatch. The thatch, which commonly consists of straw, sprots or rushes, is laid on loosely, and fastened by ropes of the same materials, or of heath; except in Kintyre, where the straw is fastened by driving in the one end into the roof with a thatcher's tool, as in the low country. A few roofs are covered with ferns, and fewer still with heather.

The tenant at his entry receives, and at his departure pays, whatever repairs the houses need for being put in a habitable or tenantable condition, according to the estimate of stated and sworn appraisers in every parish.

* The couple tie consists sometimes of one piece, with a natural bend, sometimes of two pieces fixed together at the eaves. The feet are built up in walls, which is apt to shake them. If the walls were of stone and lime, the couple soles might as well rest on the top of them, over a flag, like those of slate and tile roofs. This mode, which is less troublesome and expensive, has been lately followed in several instances in Kintyre.

As much of the comfort of life arises from being commodiously lodged, it is of great consequence to the tenant and landlord to have every farm provided with proper dwelling-houses and offices. But this can hardly be expected, while the landlords, without giving sufficiently long leases, are disposed, as they generally are, to throw all the burden on the tenant, except giving him, perhaps, the timber for the roof. Could the tenant afford it, which he seldom can, he ought not to be obliged to lay out in building houses that stock with which he ought to improve his farm, and provide for his family. The money for such a permanent improvement ought to be laid out always by the landlord; the tenant giving carriages, and paying legal interest for the money, as well as delivering the houses in a sufficient state, under comprize-ment, at the end of his lease. Thus, the tear and wear would gradually fall upon the tenants, and the landlord be at no more than the first expence; for which he would receive not only the interest of his money, but also a much higher rent for his farm than it would otherwise give; as the accommodation of good houses is of much more account to the farmer, than the interest of the money expended on them. Nothing could set off a farm to more advantage, than to have it furnished with comfortable and commodious buildings.

To accomplish any great improvement in farm houses, the present system of building ought to be entirely given up. A parcel of stones huddled up to the height of 5 or 6 feet, without mortar, or with only mud instead of it, and these walls burdened with a heavy and clumsy roof, need to be renewed with almost every lease: and the roof, generally so flat at top that one might securely sleep on it*, is seldom water-

* The writer lately measured the top of an old couple, which he found to be 10 feet wide. They are now made much narrower at top; but few have yet learned to bring them to what they ought to be, a right angle.

tight; a circumstance sufficient of itself to make the house uncomfortable, and to bring it soon to ruin.

The roof, as it is generally put on, requires to be thatched every third or fourth, and sometimes every second year; which is almost a heavier expence than slating; especially as those houses, from being so low and narrow, must be extremely long. A farmer, who does not perhaps pay 20*l.* of rent, has houses to keep up, that may extend to 150 feet, or even more. This inconvenience is great; but, happily, it is more easily removed than in most other parts of the kingdom. Stone and lime are seldom at any great distance, for building good walls; which, once built, would last for ages. Slate, from Eldale or Bute, might be brought, at no great expence, to any part of the county; but the high price of fir must leave slated roofs, in general, to proprietors; and tile roofs cannot be much commended. Heather roofs are more suited to farm-houses, as they do with our ordinary timber, can be had for a trifle, last almost as long as slates, and give less trouble in repairs. A heather roof, well put on, will last 100 years, if the timber will last so long*. It is astonishing, that, in a country in which heather abounds, these roofs are not more common. They are, indeed, heavier than straw roofs; but by making them a little steeper, and placing the couples a little nearer than in our ordinary roofs, the most of the weight will be thrown on the walls, which, if made, as they ought to be, of stone and lime, will not feel the burden.

Next to heather, but at an immense distance, is fern; a good coat of which, if well put on, will last from 10 to 15 years. All thatch should be put on when the roof is perfect-

* Of old, most of our churches in this county were covered with heather. Heather roofs are frequent in the district of Cowal; and there are a few of them in Kintyre. In our great rage for destroying heath, it would be wise to save at least as much of the proper kind as might be needed for thatching.

ly dry; otherwise it will ferment, and soon rot. This is a circumstance that ought to be attended to.

In constructing farm-houses, the chief objects which should be kept in view, are these three; convenience, cheapness, and durability. It may be difficult to devise any general plan which would unite all these, and, at the same time, be easily accommodated to the various sizes and circumstances of the ordinary run of farms in this county. Perhaps the following plan, by making the buildings shorter and more compact, and thereby requiring less roofing, may be found as convenient and cheap as any; and if constructed of stone and lime, with a heather roof, will be abundantly durable.

1. A dwelling-house, 30 feet by 16, within walls, and 10 high in the sides, above the level of the threshold, which ought to be always at least a foot higher than the ground without, in order to make the floor dry and comfortable. These dimensions will admit of a kitchen in one end, and a family room in the other. They will also admit of excellent garrets (having 3 feet of the side walls) for keeping and sleeping places, with a stair in the middle, opposite to the main door. Each of these garrets will, if requisite, admit of 2 beds on either side, as will also each of the ends below; and there will be a small cellar under the stair, and a closet at the top of it; all which will give any ordinary family abundance of accommodation*. The garrets, as well as the apartments below, should have vents, were it only to make the air circulate, as ventilators. The window of each garret should not be in the roof, but in the gable, near 4 feet from the side wall, and as high as the skew in that place will admit; though, if the office-houses are annexed to one end, there may be a necessity for having the window of that end in the roof; if the offices

* If necessary, the kitchen might be without, at one end of the house, with a communication to it from the landlady's room; or, on a large farm, the house might have a second story.

be not lower in the walls, or in their stance, than the dwelling-house.

Supposing the landlord to furnish the timber for the roof, and the tenant to give the carriage of all the materials, the expence of such a house may in general be estimated nearly as follows, when gone about with economy, and when fir is at a moderate price.

Quarrying and burning limestone,	-	£. 2	0
other stones, in addition to those in			
the old houses,	-	1	0
Building 4 roods of wall,	-	4	4
Thatching 3 roods with heather,	-	1	16
53 yards flooring and joisting, 10l.; stair, 25s.		11	5
2 lower partitions of stone and lime, 5 or 6			
inches thick *,	-	0	10
2 upper do. of Scotch fir,	-	2	0
Doors and windows, and lath and plaster for			
garrets,	-	7	5
		£. 30	0

2. From one end of this dwelling-house the offices should be extended in a line; for the eddy winds, occasioned by mountains and glens in this country, would render it less proper to make them in the form of a square or court, which would expose them to suffer more from the violence of these blasts. The offices may be 16 feet wide, and 8 or 9 high in the side walls, or rather 10, like the dwelling-house. Next the house may be an apartment that will serve for a milk-

* These cheap partitions have been lately introduced in Kintyre, instead of brick ones. The builder works on one side, having a sliding board opposite to him, and shifting it up every tier as he proceeds, which forms the other face, without any trouble.

house in summer, and for a potato-house in winter. This may be 8 or 10 feet, or what may be judged necessary. It is separated from the barn, which comes next, by a partition to the height of 6 feet, and covered with a loft, which opens to the barn, and receives the grain that is thrashed or cleaned out. A loft for this purpose will keep the grain from heating or growing, as it is apt to do on an earthen floor, and will keep the barn clean and roomy. By means of this loft, and of another opposite to it, on the other side of the barn, and over the byre (for holding the stack or unthrashed corn), the barn needs be little more for an ordinary farm than 10 or 12 feet; for thrashing and cleaning the corn*. It is separated from the byre on the one side, as it is from the potato-house on the other, by a thin stone and lime partition, to the height of 6 or 7 feet, reaching the edge of the loft. The length of the byre, under this loft, will depend on the number of cattle. If they do not exceed 10 or 12, the most convenient form is to have the door in the middle of a space of 15 feet, the gutter opposite to it, and the cows ranged on each side of it, across the house. But if there are more cows, the byre must be extended in proportion, and the cows ranged lengthwise. Beyond this may stand the stable, suppose 12 feet long, and separated from the byre by such another partition as before, with a hay or flax loft, and at the end of it a cart-shade†, above which there may be a hen-loft.

The different dimensions specified for offices make in all about 50 feet, and might serve to accommodate such a farm as could be managed by one plough in this country, or from

* Although this may serve, yet it would be of great advantage to have it larger, as abundance of barn-room is so great a convenience and gain, that it will soon repay the original cost.

† A large farm might admit the cart-shade, as well as the milk-house, to be under the grain-loft; from which the cart might be loaded with the grain through a trap-door.

40*l.* to 60*l.* rent. The quantity of wall, as there is but one gable, would be nearly the same as in the dwelling-house, and the quantity of roof about 1-5th more, with about 1-6th more joisting and flooring. All this will amount to nearly what was stated above for the dwelling-house; and the plan, as a very inconsiderable expence, might be extended so as to suit a larger farm.

It has been said that none ever built who would not improve upon his plan if he were to build again. The above plan of a small farm-house and offices contains all the improvement which has occurred upon one nearly the same, after 10 years experience of the accommodation. The convenience has been found to be great, the expence moderate; and, if the roof were covered with heather, the work would be so durable as to give little trouble for several generations. Our common slovenly and incommodious buildings, ever needing repairs, and never right, are vastly more expensive, as well as less comfortable and convenient.

The situation of farm-houses should be central in respect to the farm, convenient for water, dry, sheltered (if this is attainable), and if in a valley, they should run in the same direction with it, which is the common direction of the wind; but if in an open situation, they should run east and west (and face the south), as in this county, the winds blow oftener, and with more violence, from the west, than from any other quarter.

SECT. III.—*Cottages.*

THESE are for the most part mean and wretched hovels, except where a tradesman may have, here or there, found proper encouragement to build for himself a comfortable habitation. The cottages are not only bad, but in most places few in number; an evil which, if not speedily corrected, must

prove a very serious loss to the farmer, to the landlord, and to the public. Without cottages to rear them, the farmer must want servants; the landlord, people to improve his ground; and the public manufacturers, sailors, and soldiers. A great part of the strength, wealth, and prosperity of the nation is derived from that hardy, virtuous, and laborious set of people that is reared in the humble cottage; and if their interest everywhere shall continue to be so much neglected as it is generally with us, the interest of the nation will soon suffer. If, as all allow, the principal strength of a nation consists in the number of its people, and especially of the most laborious and industrious part of them, it must of course be the soundest policy to encourage cottagers.

Every farm-house should have at least one comfortable cottage-house annexed to it. If the cottager should have the same lease with the farmer, and the landlord to furnish the timber, he would build such a dwelling with his own hands, or with very little assistance. One decent apartment, with a small cellar, would serve him.

The cheapest way of building cottages would be to put two dwellings under one roof, as the same gables would serve both. Each end should have a vent, and a large glass window, both for health and comfort. They should also, like the farm-houses, be built with lime, and covered with heather. Where the materials are easily got, the difference in the expence between doing them well and ill is trifling, and would soon be repaid from their being durable, and needing few repairs. The cleanliness, health, happiness, and decency of aspect of this useful class of people, would be greatly promoted by such a measure.

Every cottager should have also a small spot of ground that might enable him to keep a cow; and should have his interest so secured by the landlord, as not to lie at the mercy of the tenant. Their own interest, as well as humanity, require

of landlords to take a near concern in the happiness of this class of men : And happy will it be for them, and for the country in general, if landlords shall condescend to do so. Some more observations on this subject will fall more properly under the following chapter.

CHAPTER IV.

MODE OF OCCUPATION.

SECT. I.—*Size of Farms.*

THE size of farms in this county is so different, in different parts of it, that some may be computed by the number of acres, and some by the number of miles which they contain. In the lower parts of the county, where tillage is more attended to than pasturage, or where these two objects are conjoined, the possessions are generally of a moderate size; but in the upper parts, which are mostly under sheep, they are in general of a vast extent. One is computed to be 18 or 20 miles in length, and from 3 to 4 in breadth*. It is true no other comes near to this; but possessions from 2 to 6 square miles, and sometimes more, are not uncommon. The occupiers of such large tracts seldom cultivate many acres. The little meal which they need for themselves and their shepherds is brought from the market, while their fields, rescued from the wilderness by the labour of ages, are allowed to revert to their original state, and to become a wilderness again. The same possessions, if in many hands, might be so cultivated and improved as to maintain many families, and even more cattle, and would in a short time be brought to yield a higher rent; so that the public and the proprietors would both be gainers: Whereas, by the present system, both are in the way of suffering an enormous loss, for which the gain of a few storemasters is no adequate compensation.

That this system, by depopulating the country, is a mani-

* Dr. Robertson of Dalmeny, in his *Treatise on the Size of Farms*, calls this the largest in Great Britain.

lost, perhaps an irreparable loss to the public, is obvious to the most shallow observer. It will perhaps be said that the numbers banished from the country are not lost to the state (though they are lost to the county), as most of them take refuge in manufacturing towns and large cities. But it is well known that these towns and cities cannot support their own numbers without a constant supply from the country; and when the country is so far wasted as to be no longer able to afford that supply, the towns must decay of course.

Large towns and cities have with too much truth been termed the graves of the human species. The inhabitants of such are more sickly and delicate, their employments more unhealthy, the air they breathe more impure, and the danger from infectious diseases more unavoidable, in proportion to the numbers thus crowded together. This last circumstance is peculiarly fatal to children in large towns, and accordingly a much greater proportion of them die there than in the country; and those which survive are more weak and delicate. Hence, as many as can afford it take every opportunity of sending their children to the country, especially after they have been ailing, as the best way to recover their health and vigour.

But if large towns are unfavourable to the health, they are still more so to the morals of a people. The mind is at least as liable to contagion as the body; and wherever a number of people is crowded together, the infection of vice is rapid and alarming. Vice soon spreads its influence from one to many; "from individuals to families, from families to cities, "from cities to the empire; and an empire corrupted is an "empire lost." The state is therefore greatly concerned in taking measures to check an evil which has been rapidly increasing for many years over all the kingdom; and which, if it goes on, may hasten its destruction. Both the strength and virtue of a kingdom consist in having its inhabitants

spread as equally as may be over its surface, and in a proper balance and proportion being kept between the population of country and cities, and between those employed in rural employments, and in trade and manufacture. If this proportion is destroyed, it is easy to see that a state must rapidly decline, however great its wealth, and however numerous its armies.

In such a case, the army and navy must be chiefly supplied from the lower ranks of large cities, whose general characteristic is debility of body, and depravity of mind, as it has ever been in all rich and populous cities. How far the defence of our rights and liberties, lives and property, may be safe in such hands, or how far they are fitted for undergoing the dangers and toils of a soldier or sailor's life, if these should entirely fall to their share, may be justly questioned. It was by men of this description, who had little or nothing at stake, that the state was lately thrown almost into convulsions; while those in rural occupations, strangers to riot and cabal, and more under the influence of religious, social, and moral ties, showed themselves loyal to their king, and attached to their constitution. But if the number of these shall continue to decrease, their vigour and their virtue may be of small avail. The country is the great seed-bed of population and of virtue. The children there are more numerous, more virtuous, and more frugal, than those brought up in large towns and cities; and the inhabitants in general are more peaceable, orderly, and virtuous.

Nothing can more merit the attention of our wise and enlightened statesmen than to consider what measures ought to be taken for encouraging population in the country, so as to preserve its balance in respect to cities; for on this the strength and security of the state must ultimately depend. The degree of preponderance which towns and manufactures have already acquired over agriculture and the population of the country, threatens the kingdom with a scarcity of bread and other

ferious evils, to which the accumulation of small possessions into large ones have greatly contributed.

Some have indeed maintained that great farmers bring more to market than small ones from the same quantity of land, without considering that the small ones maintain so many families at home, as will make up for the difference to the public (if indeed there is a difference), and that these families are employed more innocently and more usefully to the public than those who are supplied from the market. It is irrational to suppose that one family can improve any space of ground so well as 10 or 20, having that space divided among them in shares proportioned to their strength and capital. Even if the one should employ as many hands as the 10 or 20, they will not nearly work as much; for one man working for himself will perform almost as much as two when hired by another: and their hard labour, frugal living, and close attention, will enable them to pay more rent than one man living in a higher style, and employing many servants, can afford.

The same will hold with respect to grazing farms, or sheep possessions. The space of 2, 10, or 20 square miles, would certainly be of more account to the public and to the landlord in the hands of 2, 10, or 20 families, than in the hands of one. For, in the *first* place, He who makes the grafs to spring, cannot be supposed more partial to the rich than to the poor, to the one than to the many; so that the land, if left to itself, would be no less productive by being thus divided, and therefore of equal advantage to the public. But, in the *second* place, the many would cultivate and improve the ground; and without going, like the storemaster, to market, would not only bring their own frugal living out of it, but also a surplus of food for their cattle, by which the ground could maintain a greater number. All this would be so much gain to the public, and so much advantage to the landlord:

for it may be laid down as an indisputable maxim, that the plan which most improves the land, will always prove the most beneficial to the landlords.

Proprietors are no doubt excusable for adopting any method by which they think to bring their lands, in the speediest manner, to their highest value. But it may be confidently affirmed, that the way to do this is not by giving large possessions to one, and banishing many. By this means, all competition is in a great measure excluded, and a sort of monopoly, extremely adverse to their own interest, is encouraged by the landlords *. Their lands in this manner can never be improved; and if the lands are not improved, the rents must soon be at a stand. It is certain that, from comparing the past and present rents of both, such lands in this county as have been let in small possessions, are more advanced in their rent, and, from their greater improvement, more likely to advance still, than those lands which are let in large possessions †.

It is, however, necessary to observe, that possessions may be too small, as well as too large; and there are too many instances in the county of their being carried to the one extreme as well as to the other; especially when the lands are

* When large estates are brought to market, they are cut down into moderate lots, in order to excite the greater competition. Would it not be the interest of landlords to follow the same plan in the letting of large possessions? They would let best by adapting them to the capital of the common run of farmers, which in the Highlands is very moderate.

† Perhaps, even under this system (of large possessions), proprietors might have attended more to their own interest and that of the public than they have done; for these interests, when rightly understood, are by no means opposite. It has been suggested that they might oblige the tenants to keep at least a certain quantity of the lands formerly arable in a state of cultivation; and to improve yearly a certain quantity of waste ground. This would redound to the interest of the public, of the poor, of the proprietor, and, as there is reason to believe, of the tenant also; although the general advantage of it would by no means be equal to that of giving small or moderate possessions.

let in *run-rig*. A small possession under this system, and perhaps held without a lease, could hardly support a family without paying any rent at all. Every tenant who has no other business, should have as much land as to give himself and his family constant and regular employment *. But how much this should be, must depend upon such a variety of circumstances, that no general rule can be given with regard to it. The nature of the soil, wet or dry, cultivated or wild, enclosed or open; whether it is most adapted for corn, cattle, or sheep, and a variety of other circumstances, must tend to vary the size of farms. The general state of the skill and industry, and the ordinary run of capital possessed by farmers in the country, must also be considered; and much regard must be had to the boundaries marked out by nature, by which the old divisions of farms were generally regulated. All these circumstances considered, there must be in every district some larger and some smaller farms; but extremes on either side should be avoided, and a middle course should as much as possible be observed.

Of sheep farms, on lands consisting almost altogether of pasturage, perhaps the most common size should be as much as one person could well manage, which is generally supposed to be as much as would maintain 600 sheep. In determining the proper size of arable farms, that which seems to promise best for the improvement of the country and the increase of population, is, that the farm should be as much as a farmer, with one servant and one plough, can easily manage and properly cultivate. This cannot be much, where (as with us) the lands are in such bad order, and the fields small, detached, and distant. It may be, in general, from 30 to 45 acres of arable land, with whatever pasture may happen to be con-

* Every tenant ought also to be in a higher rank than any labourer, tradesman, or country manufacturer, as his care, industry, and exertion, must be equal to their's, and his stock or capital, and risk, much greater.

nected with it. This pasture may be sometimes more and sometimes less; but taking the average proportion of the county (of 1-13th being arable), it will allow from 400 to 600, or at an average 500 acres to a farm. In most parts this much may be managed by the farmer and his family: or, if he should find it necessary to hire the one man whom he needs, yet, as he must be with him almost always himself, he can turn his service to more account than the master of many servants, who does not share in the labour. When any family is large enough to manage more, every farm has abundance of waste or improveable land to keep them sufficiently occupied. A small possession, by superior cultivation, may be more advantageous to the tenant than a larger one which could not be so well cultivated, and will certainly tend more to the improvement of the landlord's property.

Large farms; wherever they are held by a number of tenants in *run-rig* (which is nearly the same as in common), ought to be divided into separate possessions, without which the farms can neither be improved, nor the tenants prosper*. The beneficial effects of dividing such farms, and removing the houses of each tenant to the centre of his own possession, have been found so great on the Duke of Argyle's estate in Kintyre, that some others are now following His Grace's example. When each has his own lot, the lands are better improved, and the tenants in easier circumstances. Formerly none would work till all were assembled: but now every man is late and early at his work, and performs twice as much as when the work was in common.

In no part of the county are possessions more uniformly moderate than in the parish of Southend, where each tenant has

* In the troublesome times of old it might be necessary to have the farms large, and all the dwellings set down together, for the purpose of uniting more easily for self-defence.

commonly less than a *mark-land* * cut out for himself. In consequence of this, more waste ground has been of late years improved in this parish than in any other in the county. The yellow corn now waves on the region lately occupied by the heath and moss.

The advocates for large farms are fond of maintaining, that small tenants were starving on those farms on which great tenants have made rich. But this is owing to the change of times, and not to the change of system. In such times as we have had, small as well as great tenants could not fail to thrive, and have thriven where they had equal advantages; though neither the one nor the other could thrive, if the former times had still continued. Moderate as the possessions are in the parish just now mentioned, the tenants here prospered, in proportion to their advantages, as much perhaps as any in the county. As evidence of this, it may be mentioned, that about eight-and-twenty of them, who lately formed themselves into a congregation of relief, have built a neat church, and are about to build a manse and to employ a pastor; from which they would seem at the least to be much at their ease.

In every district a few farms, in central situations, convenient for fuel, and capable of great improvement, should be let out, or rather feued, for villages, in which tradesmen

* The old division of land in this county, and that by which public burdens were regulated before the valuation took place, was by *mark-lands*, of which some farms contained more, and some fewer, according to their value or extent. The division appears to have been done in general with great judgment, the relative value of these mark-lands being in most places pretty equal. It is probable, however, that when this division took place, much regard was had to the quantity of arable land which every farm then contained. By a decree of the Exchequer (March 11. 1585), a 40 shilling (or 3 mark-land) of old extent (or 8 oxgangs) should contain 104 acres. Consequently 1 mark-land should be 33 1-3d. The denomination of mark-lands still holds here in common use of speech; and, in general, 1 mark-land may give full employ to 1 plough and 1 family in the more arable parts of the county.

and labourers might be accommodated with small possessions. This would draw more rent from such farms than they could possibly yield in any other way, and help to raise the value of other lands in their neighbourhood. It would attract useful and industrious people to the soil, by giving them a property and existence in the country; and be the means of introducing trade, commerce, and manufactures. There have been the uniform consequences of feuing grounds, and encouraging villages on judicious and liberal plans throughout the kingdom*.

Such as may be averse to feuing, or forming villages, would still find their interest in giving small possessions, in whatever way. Small possessions, being within the reach of many, will produce many competitors; and the most barren spot, by the constant labour of the many, will be soon improved, and raised in its value. If some large farms, here

* The following instance is related out of many, as being one of the least promising, and yet answered well. "Mr. Cumine of Auchry planned a regular village upon the moorish part of a farm, which, in whole, yielded only 111. a-year. He fixed 75 feus upon it, occupied by a set of industrious, honest, and active people, who, instead of 111., the original rent, produced him annually from 1201. to 1501. He introduced the spinning or weaving of linen yarn, and the consequences continue." *Statistical Account*, Vol. VI. p. 129.

Thus might the man who looks no farther than his own interest, find his greatest profit in accommodating a great number of his fellow creatures, and putting them in the way of being comfortably lodged, fed, and clothed. A noble and generous mind will have a satisfaction of a higher nature, in making numbers happy; and the man of public spirit will feel a pleasure in considering such villages as the most likely means of furnishing hands for manufacturing the wool, improving the land, and enriching the country.

The Duke of Argyle has lately taken measures for erecting a village at Monirua, in the parish of Southend. His Grace gives the villagers a lease of three nineteen years. During the first 19 they pay only the rent at which the ground let during the last lease; which, at the end of this term, and also at the end of the second 19, is a little augmented, as the improved state of the ground will easily bear such augmentation.

and there, were thus divided among a number of industrious families, wastes would be cultivated, rents augmented, and population promoted. Small possessions are absolutely necessary for the encouragement of population; without which, no country can prosper. All rests on this; for, without abundance of labourers, no important improvement can ever be effected.

It is with great difficulty that a country, once depopulated, can be fully replenished again with people. A small possession will induce the native to stay, when only a large one will induce a stranger to come; so that, in place of the many, it will be difficult, perhaps for ages, to substitute more than a few. Besides, no inhabitants can be got so well adapted to the country as the natives. They are, in general, a sober, active, frugal, and industrious race of men; and were their industry and ingenuity properly directed and assisted by all who have an interest in doing this, the riches and improvement of every estate would be in exact proportion to the number of its people. Every landlord should consider the migration of every labouring man from his estate as the loss of an active servant, who improved his land for only a bare subsistence: For, in general, they never had any more for their pains; and, in general, they would still be contented to live on the same terms, under their ancient masters. If they are not allowed to do so, the loss of them will be regretted, when it cannot be repaired; and that at no distant period: For the undue extension of farms, like every other such evil, will in time cure itself; and the cultivation of the ground will be recurred to, for the sake of bread, the first and most necessary article of living.

It is an important observation of Pliny, that large farms had ruined Italy, and were in his time ruining the provinces. Large farms will ruin any country, by discouraging population, the source of all riches and improvement. They de-

stroy the independent spirit of a nation, by putting all its property in a few hands, and leaving the greater number to have no interest in the state; so as to make its salvation or perdition to them a matter of mere indifference. Hence the once invincible Romans, as Pliny foresaw, became an easy prey to hordes of barbarians*.

The feudal system, with all its faults, had one wise and valuable property. It gave every man some share of possession, and an interest in the land; which made every man forward and zealous to support and defend the state. It strongly attached every man to the chief, or landlord, who enabled him to live upon his property. This attachment existed in the Highlands long after it had become extinct in every other part of the kingdom; and, notwithstanding all the cold water which has been thrown upon it, some sparks of it still remain. In a world so much subject to vicissitudes, and in an age so much marked with revolutions, it would be wise to cherish and keep these sparks alive, in case of there being any occasion for having the fire again rekindled.

It is but doing bare justice to the greatest proprietor in this county, to say, that he has uniformly encouraged population and moderate possessions, refusing frequently the higher offers of the few for what was held by the many, and dividing his farms, instead of accumulating them, like many others. In all his Grace's estate in Kintyre, yielding above 7000l. a-year,

* Every landlord who loves his country, or regards his own property and interest, ought to give all the check in his power to a system fraught with so much mischief. Such as have neither the public spirit nor the wisdom to do so, ought to be obliged by those who have the care of the state in charge. A law to regulate the size of possessions, by taxing farms according to their rent, if exceeding a certain sum, would be the most popular and beneficial that could be well devised. It might be hurtful to a few monopolizers, and troublesome, perhaps, to a few factors or stewards; but salutary to the state, and advantageous to the landlords, as it would tend to the rapid improvement of their estates, and increase the value of their property.

there is but one large sheep stock, and that on lands not much adapted for tillage; and this is not given to one, but to several. Sheep on such lands, given in small shares or possessions, would be a blessing to the country in general, instead of being a benefit only to a few*.

In consequence of this system, of giving small or moderate possessions, the estate mentioned is more improved, and in the way of advancing more in rent, than most others in the county. In consequence of this system too, so favourable to population, perhaps no subject in Great Britain could, upon any great emergency, gather more men around his standard, or stand more secure of their affection, than the Duke of Argyll.

It must be observed, however, that on some parts of this nobleman's estate, as well as on many others, one essential branch of rural establishment is greatly neglected. The cottagers, in many districts, are extremely few, and much discouraged. This is more especially the case of late; for even farmers, blind to their own interest, have caught a portion of the unfeeling and intolerant spirit of those who lessen the population of the country. It is from cottages, that servants, and labourers for improving the ground, are to be looked for; and the present scarcity and high wages of servants must, in a great measure, be ascribed to there being so few cottages in most parts of the county. This circumstance is also adverse to population and industry; for servants, when they have not a prospect of so much as a house to put their head in, are dis-

* His Grace has since broke down this large possession into 4 lots, each consisting of 2 or 3 small farms, and planted with 2 or 3 residing tenants, who can give all their labour and attention to the improvement of the ground, and commit their joint stock of sheep (on each lot) to the management of a common herd. This plan, which unites agriculture with sheep-farming, and encourages population, appears to be well adapted to the nature of this county, and promises to promote both the interest of the proprietors and of the people. See Chap. XIII. Sect. 2.

couraged from marrying, and become less industrious and frugal than those who have such a prospect.

If every farm had one or more cottages connected with it, according to its extent, it would be of the highest advantage to the country. Population would rapidly increase; servants, and good ones too, would abound; and the improvement of the lands would be greatly promoted. The farmer, in this way, would be better served, than by getting new, and generally ignorant hands, at every half year's end. A cottage servant would know his master's work, and the nature of his soil; and, with skill and experience, have also more interest in having every thing forwarded and well done, than can reasonably be expected from a stranger, who, like a bird of passage, waits only for the term-day to take his departure. In hay and harvest time, the cottager's family would be a help at hand; and their aid, taken only when needed, might in many cases serve instead of a stated servant, and be cheaper and more convenient for the farmer.

To make the situation of cottagers comfortable, every cottage should have an acre or two of ground (whether improved or improveable) annexed to it; so as to enable the occupier to keep a cow, or a small horse. A little possession of this kind would be considered by a labouring man, or tradesman, as a great estate. It would encourage him to marry early, enable him in his frugal way to bring up a decent family, strongly attach him to his country, and give him an interest in its welfare. We should then hear no more the common saying of labourers, when an invasion of the country was lately rumoured: "From those who have nothing to lose, nothing can be taken."

In such cottages, useful and honest servants would be reared for the public,—and hardy, able, and active soldiers and sailors for the army and the navy: And the cottager, as he would be qualified, might, by frugality and industry, be

able to better his circumstances, and rise by degrees to the rank of a farmer of a small possession; which is no uncommon case, where cottagers are encouraged as they ought. But here the wretched hut is often grudged them, even on the hardest terms; and a cow's grafs they can seldom have for money or for favour.

Would it not then be wise and patriotic, as well as humane, in every land-owner to annex to every farm-house at least one cottage, with a spot of ground cut out with it*, at a reasonable rent, fixed by himself, and not by the farmer? For some such regulation as this, the poor cottagers look up

* "A land-owner in a parish in Worcestershire, observing that the occupiers of cottages which had land annexed to them were remarkable for bringing up their families in a more neat and decent manner than those whose cottages were without land, laid out from 5 to 12 acres to a number of cottages, added a small building for a horse or cow, and allowed grafting-stocks to raise orchards; and, in some instances, lent a small sum for the purchase of a cow, a mare, or a pig. The consequence was, that, in no one instance, this failed of giving an industrious turn, even to some who were before idle and profligate. Their attention in nursing up the young trees has been so much beyond what a farmer, intent on greater objects, can or will bestow, that the increase of their orchards has doubled the value of the land under them, and the poor rates have fallen to 4d.; while, in the adjoining parishes, there is an assessment of from 2s. 6d. to 5s. in the pound. These cottagers are labourers, and good ones: Their little concerns are managed by their wives and children, with their own assistance, after the day's work. Their stock consists of a cow, a yearling heifer, or a mare to breed (from which a colt, at half a year old, will fetch from 3l. to 5l.), a sow, and some geese. This has been the means of bringing a supply of poultry and fruit to the market, of increasing population, and making the land produce double the rent that a farmer can afford to bestow." *Agric. Rep. of Oxford.*

Much of the natural advantage of Argyleshire arises from its fishings. To improve this advantage, cottagers should everywhere be encouraged, and furnished with small possessions, to employ them when at home. The Duke of Argyle has laid out a farm in small lots near Inveraray; the occupiers of which cleared last season (1795) 800l. by fishing herring; which shows of what advantage such establishments might prove to the country, if they were more frequent.

to those of large fortune and great influence in the country: and great, indeed, will be their merit and reward, if they devote those talents with which Providence has blessed them, to serve the common cause, and their own, in the most essential manner, by rendering the situation of the labouring poor more comfortable, and promoting population. "A civic crown was formerly decreed to him who saved the life of a citizen. What adequate recompense shall be adjudged to him who shall be the means of thus adding thousands to the number?"

SECT. II.—*Rent.*

IN this county, there is very little land let by the acre. But such gentlemen as have got their estates surveyed, have also got the different farms and fields valued, for their own private information. The quality of the soil is extremely different; so that such valuations differ, sometimes on the same farm, from 2s. to 15s. the acre of arable ground. The pasture too, being partly green hill, but mostly heath, differs no less in its quality than the arable land. Some of it is valued below 4d. and some above 4s. the acre. In the neighbourhood of Campbelton, a few spots of arable land let from 2l. to 3l. the acre. But this price may be said to be put, not altogether upon the land, but partly upon the accommodation*.

* What proportion the rent of a farm should bear to its produce, depends so much on soil, climate, situation, and other circumstances, that no general rule can be laid down on the subject. On the rent of sheep-lands, as occupied with us at present, some observations may be seen in Chap. XIII. Sect. 2. In regard to arable lands more particularly, it is a common, though perhaps not a just remark, that 1-3d of the produce should go for rent, 1-3d for expence of management, and 1-3d for the farmer's profit, interest, &c. The oldest observation extant on this subject is in Gen. xlvii. 24.; where 1-5th is allowe

There is very little arable land in the county, but what is capable of higher cultivation; besides the great quantity of waste ground that may be improved in almost every farm. The land is therefore capable of being made to yield a much higher rent when better cultivated; though not a great deal of it, as is generally thought, can bear much more, in the present stage of improvement, than what is laid on already, unless it be under a different management*.

That high rents are a spur to improvement and exertion, is a common, and, to a certain extent, a just maxim. No doubt there may be some, who, if they had the land for nothing, would be ruined by their indolence. But the more common case is, that, when a tenant sees that all his exertion will not do, he becomes dispirited and desperate, and allows himself to be carried along by the stream which he cannot stem. The land suffers, the tenant fails, the farm gets a bad name, and the rent must be lowered. Thus the landlord, as well as the tenant, suffers, by raising the rent higher or faster than the improvement of the land will bear.

A substantial tenant is generally cautious of engaging to pay a rent that is exorbitant. He sees the success of those who invest their money in other branches of business; and he follows their example, if he has not the prospect of a farm's yielding him full interest for his money, and an adequate return for his diligence and labour. Whereas he who has least to lose, is often the most forward to offer; and the landlord is often tempted to accept the offer, without considering that a sufficient capital is necessary for paying the rent, and improving the land. Instances of ruin to the tenant, and

ed for rent, 1-5th for feed, 1-5th for food, 1-5th for servants, and 1-5th to lay by for provision to children.

* Sheep-lands would be more productive, by introducing a better-woolled breed; arable lands, by adopting a better system of husbandry. See Chap. VII. Sect. 3.

loss to the landlord, from too high rents, are not unfrequent, especially on some of the smaller estates. Most of the farmers toil hard, live poorly; and for one who has a trifle for his pains, perhaps two give their pains for nothing. Many who have old leases, obtained before the late rise in land, and in its produce, took place, are very well; as are also many of those who have sheep stocks; as their possessions are managed with less expence, and the value of some of them was not well known till they were tried under the sheep system. But even bad bargains are become good, by the late rise on every article of produce; and most of those who have leases are at present at their ease.

The occupiers of land, whether in pasturage or tillage, ought certainly to be able, like labourers or tradesmen, to live by their occupation, and to support their families by their daily care and labour. The interest of the money invested in their stock, with the proper allowance for tear, wear, and risk, they should be able to save as a provision for their families, and for old age; as the money so invested would give this return, if laid out on interest, without any trouble whatever. It cannot be considered as any part of the produce of the ground; and therefore no part of it ought, in equity, to enter into the payment of the rent: and yet not one in ten, perhaps, is able to save it; nor do they commonly advert that so much ought to be saved in justice. They are generally satisfied, if they can keep their stock undiminished; so that the business, in general, returns much less to those engaged in it, than almost any other. A happy predilection in favour of the occupation in which they were brought up, is what induces so many to follow it. Perhaps it may be also said, that there is implanted in the human mind, for wise purposes, a certain innate disposition, or instinct, which leads it to delight in rural occupations.

The rents in general, especially upon the larger estates,

are paid in money: but tenants on the lesser estates, and near their landlord, often pay some of the rent in kind, and are almost always subject to servitudes*. Peats must be made and led; so must the hay: assistance must, perhaps, be given in seed-time and harvest. So many wedders, fowls, eggs, butter and cheese, lint, wool, oats, meal: so much spinning from the wives, or perhaps so much yarn, and sometimes they must pay the weaver, and give it in sheets and blankets†. In short, so many hundred things are required by the laird, and so many hundred things by the lady, that it is impossible to pay them. It is sometimes expected, over and above all this, that the poor wretches shall come with presents, when they themselves are almost objects of charity! And to keep them in perfect dependence, they have often no leases. The miserable creatures on lands under this management, have neither meat, nor clothes, nor habitations; and a stranger would know them and their lands in passing, as easily as Solomon did the garden of the sluggard. Such practices cannot be reprobated in too strong terms. They are the ruin of the tenant first; and, in the end, they will ruin the landlord.

All services, whether paid to the master, or to any under him, should be entirely abolished; and all rents formed into one sum of money, including public burdens, such as minister's stipend, schoolmaster's salary, road-money, &c. Thus the tenant would always have a clear view of the amount of his rent; and save time, trouble, and perhaps expence, by having to settle only with one, instead of many. His time is

* Besides giving their time and labour, they must sometimes find their own provisions! See *Stat. Act. of Lismore and Appin*.

† A lady, who, in her wisdom, took this course, and laid up woollen treasures for many years, found, from experience, that she lived in a world where *moths corrupt*; and that blankets, like their owners, when laid up in chests, became the food of worms.

precious, and ought never to be thrown away without necessity.

SECT. III.—*Tithes.*

As no tithes are paid in Scotland, landlords can improve their grounds with much more advantage than can be done in England. In 1629, an account of the teinds in this county was taken, as they were then paid; and the amount of them at that time, in every parish, is the fund out of which the minister of that parish is maintained, by a stipend modified by the court of teinds, and proportioned among the different heritors, according to the valued rent of their respective properties*.

This measure had the happy effect of removing every ground of dispute between the clergyman and his people, on the score of tithes; and tended to produce that harmony and cordiality between them, which are so necessary to make the labours of the clergy useful. But the evil is, that this fund, sufficient as it may then have been, is now in many places become altogether inadequate for the maintenance of the clergyman. The vast rise in the value of lands, and in all the necessaries of life, with the great influx of money, arising from the extension of trade, commerce, and manufactures, with all the consequent changes in the mode of living, in the course of almost two centuries, must have reduced a fund, which has been all that time stationary, to less, perhaps, than a tenth part of its original value†.

* On this subject, see *Erskine's Institutes*.

† Professor Hutchison, in a pamphlet which is little more than 50 years old, states the clergyman in the generality of the parishes in Scotland to be the second man in point of income: now he is not generally the 20th, often not the 50th. On the continent of Argyle, the average proportion of the stipend to the rent is nearly as 1 to 30. In the county of Essex (*Agr. Rep.*), the

In consequence of this, clergymen are now sunk in their rank in society, and fallen almost to that which schoolmasters held formerly; so that many of them are obliged to betake themselves to other shifts, such as farming and grazing, in order to support their families. By this, their dignity, utility, and influence, are lessened; and the cause of religion and virtue, and, of course, the true interest of the nation, suffers: For, let our vain and new philosophers allege what they will, there can be no national prosperity, of any duration, without religion; and there can be no religion without a respectable clergy, nor a respectable clergy without a decent maintenance being annexed to the office.

The experiments, whether a state can exist without any established support for religion, and, what is bolder still, whether a state can exist without any religion at all, are both new in the history of civilized society. But it is not difficult to foresee what the end of these things shall be. The state that has no establishment for religion, will soon have no religion at all; and the state which has no religion at all, can have no comfort or security whatever. Let us then hold fast by the system under which we have prospered, till such time, at least, as the experience of those who have adopted new systems shall sufficiently warrant us in the prudence of making any change.

“Wait the great teacher TIME, and God adore.”

Religion, taken in its lowest view, is certainly what its

average proportion of the tithe to the rent is nearly as 1 to 4 1-5th. But to the farmer this grievance is not so great as may be supposed. If he paid less tithe, he would pay so much the more rent; so that it makes only the difference to him of settling with two landlords instead of one; and he may certainly derive more benefit from the religious establishments of his country than this trouble can amount to. The same observation will hold in regard to poor's rates.

enemies used to allow, till now, absolutely necessary for the order and well-being of society. Its ministers should therefore be considered as servants of the public, and paid by government, like those in the administration of justice. The church would thus be more dependent on the state, and the interests of both would be more intimately united. Preachers of that righteousness which exalteth a nation, deserve national encouragement; and promoters of that order, without which society cannot exist, deserve the support of society. The established clergy of Scotland, from their influence over the people, and firm attachment to the state, form one of the firmest pillars upon which the fabric rests; and the state, and all who have a stake in it, ought to regard them as such, and by their support and example, do all that may be necessary to preserve religion and its ministers from falling into contempt, in order to preserve the state from falling into ruin*.

An order of men, whose learning, talents, industry, and virtue, are all devoted to the public, should be maintained by the public in that rank which it is the interest of society they should always hold; that is, that they should not be rich, but that they should be comfortable and easy, in order that they

* "Of all the dispositions and habits (says President Washington) which lead to political prosperity, religion and morality are indispensable supports. In vain would that man claim the tribute of patriotism, who should labour to subvert these great pillars of human happiness, these firmest props of the duties of men. The mere politician, equally with the pious man, ought to respect and cherish them. A volume could not trace all their connection with private and public felicity. Let it be simply asked, Where is the security for property, for reputation, for life, if the sense of religious obligation desert the oaths, which are the instruments of investigation in courts of justice? And let us, with caution indulge the supposition that morality can be maintained without religion. Whatever may be conceded to the influence of refined education on minds of peculiar structure, reason and experience both forbid us to expect that national morality can prevail in exclusion of religious principle." *Washington's Resignation.*

may be respected and useful. If this be not done, the men who should fill the office will naturally betake themselves to other employments, and their place will be supplied by such as ought to have neither lot nor part in this matter.

Parochial schoolmasters are in the same predicament with ministers, and their situation merits and demands the attention of the public. Parish schools are an institution peculiar to Scotland, and the wisest that was ever devised by any nation; for nothing can be of more importance to any nation than to have the minds of the rising generation stored with useful knowledge, and with the principles of religion; which is the object of this institution. It is to be much regretted that the encouragement given to the teachers is so inadequate to the importance and labour of their office, that men properly qualified are now seldom disposed to follow the occupation. A schoolmaster should be a man of parts, learning, and virtue, in a very eminent degree, in order to qualify him for forming the minds of youth to public and private usefulness, to respect of character in this life, and to everlasting happiness beyond it; and the man who is qualified and appointed for so important a business should be highly valued, and ought certainly to be easy and independent. But, instead of this, he is depressed and despised, and often obliged to subsist on an income inferior to that of the ploughman*. In proportion as this evil grows, ignorance and vice must grow along with it; and the effect which the growth of these must have upon the public happiness or national prosperity may be easily conceived. Nothing could be more ungenerous, or even more impolitic, than the opposition lately given by the landed interest of Scotland to the application

* A lover of his country must be grieved to read in one of the statistical accounts of the three offices of headle, grave-digger, and schoolmaster, being united in one person, and bringing in all an income of only 8l. a-year!

made by this useful class of men for an addition to their salaries.

There are, however, in this county several schoolmasters whose salaries are above the *maximum** which the law ordains for them. The charity schools too, of which we have many †, are generally well encouraged by the heritors. A few years ago the writer had occasion to point out to the secretary of the Society for Propagating Christian Knowledge, two stations in the part of the country where he resides which stood much in need of schools, and was told that the society would give salaries, if the heritors would give the necessary accommodations. This was no sooner signified to the Duke of Argyle, than immediately he ordered 100 l. to be given for building two slated houses, and 10 l. a-year in addition to the salaries allowed by the society. It is by deeds like these, and not by his coat of arms or titles, that a great man is ennobled.

In speaking of schools, it may be proper to observe, that of late years less pains than formerly are bestowed, both by parents and schoolmasters, in giving children a religious education. The great object now is only to fit them for business, as if the principles which lead to peace of mind and respect of character, and to every duty which is due to God and man, were matters of lesser moment. Even the short system of faith and practice contained in our church catechism, though it may be repeated in 20 minutes, is now thought too great a burden for the memory of children. The General Assembly of our church has, with great propriety, recommended of late to all ministers to attend to this important business; and it is hoped they will do so. Abstracting from

* The *maximum* is 200, and the *minimum* 100 merks Scotch.

† On the continent are 21 charity schools on the first patent, their salaries 22l. 10s.; and 17 on the second patent, salaries 84l. In the isles, 13 on the first patent, salaries 169l.; on the second patent 3, salaries 14l.

the considerations of eternity, a religious education, and a mind well stored in youth with the maxims of piety, with prayers, psalms, hymns, and portions of scripture, must be absolutely necessary to make any one pass through life with comfort to himself, and with satisfaction and utility to others.

SECT. IV.—*Poor Rates.*

In this county there are as yet no poor rates or assessments. The poor are supported by begging, by the collections made at the church doors, a few mortifications or bequeathments, and other casualties. Such as are able to beg make a tolerable shift to live, as the people in general are disposed to be charitable. But all the relief that can be given to those who are unable to go about, is scanty and inadequate. The poor, it may be said, are for the most part supported by the poor. Some of our heritors have no residence in the county; and many of our gentlemen, who think themselves wiser than their fathers, are not always where they ought to be on Sunday, to give to the poor their offering.

This growing neglect of public worship and of the Sabbath, considered only in a political view, is surely alarming. The Sabbath is the great fence of religion; religion the great fence of property, security, peace, and order. Such as have much to lose, even in the present world, should therefore be the foremost to observe the Sabbath and all the ordinances of religion: for if the multitude, ever prone to follow the example of those in any station above them, shall, as may be well apprehended, follow their example in this, there will soon be an end to all order, and government must give place to anarchy*.

* France was in profound peace (in the year 1787) when Neckar, in his book on the Importance of Religious Sentiments, founded the alarm of im-

It is an observation of Yorick (or Sterne), and worthy of a wiser man, that "those gentlemen who now throw off religion, may soon find it necessary to take it up in self-defence." But then the danger is, that they cannot induce others to take it up, after they have once brought them the length of laying it down. It is much easier to keep religion while we have it, than to recover it if we shall once lose it. In the meantime, if some of our gentlemen will have no religion, they should have some charity, and at least send their collection for the poor.

By the laws of God and of our country *, the poor have a right to be maintained; and the withholding that from them to which they have a just and legal title, is an injury so much the greater, as they have the less ability to enforce their claim. Assessments would make the burden alight, as it ought, equally upon all, whether they attend church or not, whether they reside on their estates or elsewhere. Charity, justice, and even policy, require that this should be done without delay. The poor have increased, the weekly collections in many places are diminished, and the price of all the necessaries of life is greatly raised.

The arguments commonly used against assessments are but the suggestions of iniquity and avarice. Assessments have become common in the south of Scotland, and (as the exercise

main danger to the state. People of fashion, as if they thought that religion was made only for the vulgar, had before then given up the observance of the Sabbath. The vulgar, as always happens, were pressing close on the heels of their betters; and even a public work (a bridge on the Seine) was carried on as well on the Sabbath as on other days, without any necessity. The event turned out as Neckar foretold; and ought to be an awful warning to others.

† By an act passed in 1740, "the heritors, minister, and elders of every parish are required to make a list of all the poor within the parish, and to liquidate a yearly sum for their maintenance; the one half to be paid by the heritors, the other half by the other householders."

of justice and charity always must be) have been productive of good and not of evil. They have enabled the poor to live with more comfort, and made the trifling rate fall on those who are liable to pay it, in a just and equitable proportion. The non-resident, the graceless, and the sectary, are obliged to contribute their share : and the labouring poor, the most numerous class of the people, are attached to a happy constitution, which makes a legal provision for their support when they can no longer support themselves.

By assessments, the begging poor would not only be more comfortably maintained at home, but also at less expence to the public ; as their labour at home would go a considerable length to support them ; whereas, in travelling about, their time and labour turns to no account. Besides, the blind and the lame require one or two to attend them every day that they are going about. By assessments, the burden on the tenants would be less heavy and more equal ; and the small difference to the rich would easily be made up by retrenching, now and then, a superfluous dish or bottle, an useless trinket, or a game at cards *.

* “ It is asked with some degree of alarm (says Dr. Charters) what will
 “ be the final consequence of alimentering the poor ; for, wherever this tax is
 “ imposed, it increases gradually ? This gradual increase, where it takes place,
 “ may be owing to two causes : 1. That some are induced, through false shame,
 “ to suffer extreme want before they will accept of an aliment : 2. That those
 “ who appoint the aliment are at first too sparing ; the more frequently and
 “ attentively they consider the case of the poor, they are disposed to give the
 “ more. Let false shame be combated, and the miserable instructed in their
 “ rights. Let those who have the management of the poor, proceed till every
 “ indigent person be found out, and their real wants supplied. When all that
 “ need have been persuaded to ask, and when those who give have learned to
 “ give enough, the rate will become stationary ; till then it ought to rise.
 “ The law which gives a maintenance to the poor, is one of the bulwarks of
 “ the British government, by which it is defended from the rage of want and
 “ despair. Heritors and kirk-sessions, to whom the execution of this law is
 “ committed, will give a substantial and seasonable proof of their attachment

It would, however, be much better, if some method could be devised to make the poor support themselves, by contributing a trifle, in the days of youth and health, for a provision against sickness and old age. A penny, or even a halfpenny a-week, contributed in the one season, would afford a relief of 2s. or

"to our happy constitution, by making the poor of the land to participate its blessings. Were those who lately assumed to themselves the amiable name of *Friends of the People* to new-model our constitution, it is much to be feared that a law in favour of the indigent would not be found in their code; and if such a law were found in their code, it is still much to be feared, that the new possessors of unrighteous mammon, would not be forward to execute the law of mercy." *Statistical Account*, Vol. XV. p. 641.

Assessments in Scotland are considered by many in the same light with poor rates in England. But they are so totally different, that English writers who treat of these matters, frequently contrast the one with the other. "In Scotland" (says Mr. Dyer on *Poor Rates*), the assessments are raised by the heritors themselves (according to the valued rent of heritors and tenants) by mutual consent; but are not raised at all, unless where church collections fail. Very different these from the poor rates in England; where, if after one, or at most two calls, the money is not paid, a person may be summoned before two justices to answer for such refusal or neglect, and his goods may be distrained."

Besides the difference in the mode of raising, there is also a vast difference in the mode of managing. The assessments in Scotland are managed with no expence; whereas the poor rates in England cost almost as much to manage them, as goes to maintain the poor. According to a report of a committee of the House of Commons in 1787, the whole sum of the poor rates raised in England, upon a medium calculation of three years (1783, 1784 and 1785), was

L. 2,100,587

The nett money applied to the relief of the poor, only 1,496,129

The rest of the sum raised, went in *parish entertainments, overseers expences, and lawsuits!* DYER'S *Complaints of the Poor*.

In the Royal Hospital of Bridewell, in like manner, while only 13,451h 7s. 4d. had been expended on the objects of the charity; the salaries, &c. of officers cost 19,254l. 4d. besides 3234l. 9s. 1d. in feasts, and 17,332l. 19s. 7d. in repairs. *Monthly Review*, Jan. 1794.

It appears, then, that the principal grievance attending poor rates in England is owing to the expence of management, which costs nothing in Scotland, as it is done by kirk-sessions, and under the inspection of the heritors.

3s. a-week in the other. Establishments of this kind should be formed in every parish, and encouraged by the monied and landed interest. The happy effects of such charitable institutions are noticed in many of the statistical accounts (such as those of Kirkcaldy, Kilsyth, &c.), which might help persons versed in calculations of this nature to form some just and equitable scheme, and upon infallible principles, that might be safely and generally adopted. Every person, upon leaving one parish, should have an equal price for his share in its funds (according to tables that might be constructed for that purpose), but be obliged to transfer it to the funds of that parish into which he enters. Such a scheme would cherish the habits of industry and frugality in the poor, and provide against the great inconvenience which the poor labour under in England, from the difficulty of removing from one parish to another.

SECT. V.—*Leases.*

THE most common term for which leases are granted in this county is 19 years. Of late years it is seldom more, often less, and some landlords give no lease at all. These last can expect no improvement, and consequently less rise of rent.

The entry to the grass and houses is at Whitsunday, and to the arable land at the Martinmas following *, after the outgoing tenant reaps the crop which he left behind him. He is allowed the use of the barn to thrash his crop, and obliged to leave 1-3d of the straw to his successor. It is plain that it would be for the advantage of all parties, if the incoming tenant were always obliged to take the whole crop at

* On one estate, the entry to the arable is also at Whitsunday. The outgoing tenant leaves the ground ploughed, and his successor sows it. It may be supposed that the ground will be ill ploughed, and the dung little cared for.

an appraised value, as is commonly done with sheep stocks, by arbiters mutually chosen. The rent is payable at Martinmas, after the crop is reaped or disposed of. The entering tenant gets the houses repaired, in a habitable condition, and is obliged to leave them so, under comprisement. But if they should be twice as good as he found them, or should he make any addition to them, he has no allowance for the melioration; but instead of that, pays whatever repairs they want. This appears a hardship; and one should think it would be fairer to value them at going in, and again at going out, and to pay or receive the difference. But it is difficult to change the established customs of a country.

The leases in general have few covenants. Those granted by the Duke of Argyle commonly enjoin the tenant to drain and enclose to a certain extent. This, for some time, was the only augmentation of rent required by His Grace, and still it makes a part of it. The time for performing those improvements is also limited to as short a period as may be; so that the tenant may reap as much as possible of the advantage of his own improvement during the currency of his lease*. His Grace is also in use of giving a new lease some years before the old expires, to prevent the ground from being too much run out. As to the mode of managing his land,

* When the tenant sees that he has thus the prospect of being reimbursed, he will execute the work the more cheerfully and speedily. When, therefore, the amount to which he is to improve is fixed upon, it would be desirable that his own opinion should concur with that of his landlord, or improver, as to the mode in which his money should be most usefully laid out, of which few should be able to judge better than the tenant himself. One obvious remark may be made, which is, that no partial improvement should be prescribed. If a dike, for example, is to be built, it should be so contrived as to make a complete enclosure of a field, that the farmer may have the full and immediate benefit of it for winter green crops. And as the best lands will pay best, they should be enclosed first, except in the case of improving moss lands, which require to be instantly enclosed, to save them from poaching.

or the rotation he is to observe, the tenant is seldom or never laid under any restrictions. If he pays his rent, he is allowed to do it in his own way. This liberty may in general be favourable to the tenant. But if he has not both skill and honesty to make the proper use of it, which is more than can always be expected, it may prove detrimental both to himself and to the landlord. Restrictions, however, if at all proper, (except perhaps at the end of a lease), ought to be few in their number, and general in their nature; such as the number of crops that should be taken, and that they should be white and green alternately. Instructions and example may serve to show the farmer his interest, and how soon he is convinced, he will no doubt pursue it.

A landlord, in letting his lands, ought to have in view the proper management of them, as well as a good tenant and an equal rent. The last of these objects, the rent, is too often the chief, if not the only one, that is attended to by many landlords; and it is fully accomplished by the common mode of receiving private offers; though the wisest landlords do not always accept them, as they often proceed from ignorance, necessity, or malice.

It must be allowed, indeed, that many landlords have no other way of knowing the value of their lands, or of bringing them up to an equal rent but this, or that of letting them by auction. They say, with some degree of justice, that the tenants only are to blame if they hurt themselves, when allowed to make their own rent. It may be also said, that competition leads to exertion, and exertion to improvement, and improvement to the general good of the public.

When this mode is not adopted, every landlord should be at due pains to know the nature and value of his lands, the purpose for which they are best adapted, the management that best suits them, and the rent which they can well bear. To this purpose he should apply them, this management he should prescribe, and this rent he should openly demand, and then

choose his tenant; giving always the preference to the one he has, if he has been found to deserve it. This would create confidence in the landlord, and give encouragement to improvement.

The length of the lease should be proportioned to the improvements to be made on the farm; unless the landlord makes those improvements himself, and exacts interest for his money. No wise tenant will lay out much on the improvement of his farm, or even of his stock, if his lease is not long enough to reimburse him with interest. On lands open, and so little cultivated as most of this county, 19 years is thought too short a term for carrying on any great or permanent improvements. A farm in a bad condition, or exhausted state, takes more than half this time before it can be got into good heart and in good order: and by that time the farmer is discouraged from proceeding, as he is not certain of reaping the fruit of his labours.

Short leases are a great obstacle to improvement; and long ones can hardly be expected while lands are so rapidly rising in their value, and their produce yearly giving a higher price. It were much to be wished that some plan could be devised, by which a tenant of skill, industry, and ability, could go on without interruption or dread of removal, while, at the same time, the landlord should have an adequate rent for his lands. But such a plan, that could be accommodated to all times and places, it is difficult, if not impossible, to contrive*.

* A plan of this kind has been proposed by Lord Kames, and applauded by many. His Lordship proposes that leases should consist of certain fixed periods, at the end of each of which (suppose 19 years) there should be a stipulated rise of the rent; allowing the tenant, upon giving due warning, to resign, if he pleases, at the end of each; and allowing the landlord upon the like warning to turn him out, provided he pays him 10 years purchase of the advanced rent, supposed to arise from the meliorations made by the tenant on the faith of his being continued in the possession. If the tenant shall offer a still higher rent than was stipulated, the landlord shall pay him 10 years purchase of that offer also. This will encourage the farmer to improve with spirit, as at the worst he may expect a reasonable return for his exertions: and the landlord,

All leases, except in the case of death or bankruptcy, should exclude assignees and subtenants, in order to prevent one from oppressing others, and it would be well if no farm was let to any who does not himself reside on it. Even the poor cottager is of such consequence to the landlord, as to merit such a stipulation in his favour as may secure him from the oppression of any little tyrant. If services and public burdens are not entirely excluded from leases, as they ought, they should at least be few, and well defined, in order to prevent any disagreeable difference. For the same reason the circuitous language of law, which plain farmers cannot understand, should as much as possible be avoided.

Differences between Landlords and Tenants.

THESE seldom occur in this county, as the lands are for the most part held by leases which specify the covenants clearly, and contain few restrictions. And where there are no leases, there is no room for any dispute, as the supreme law must be the landlord's pleasure. Most of the lesser and more frequent causes of difference, such as the repairs of houses, dikes, &c. are settled by judicious men, who are sworn appraisers, appointed in every parish for such purposes.

This is an excellent institution, and it were much to be wished that a legal sanction could be obtained for having all

if he thinks it his interest to remove him, can be no loser in giving him such a remuneration for his improvements; as this would be as gainful to him as if he bought a new estate, free from taxes, for only 10 years purchase.

But it may be objected to this ingenious plan, that lands, without any melioration at all, may rise in the course of 19 years much higher than could have been foreseen or expected. In this case it would be hard that the landlord should either lose the advantage he is justly entitled to, or pay 10 years of the increased value, which took place in consequence of the times, and not of any meliorations made by the tenant. This matter, however, might probably be adjusted by arbiters mutually chosen.

differences between one man and another, at least under 50*l.* value, settled by a jury of plain, honest, and intelligent men in every parish, which would save many a tedious and expensive process. In a county so scattered and extensive as this, a wise man will rather forego his interest, than dispute it in a process before the Ordinary, who may be 50 or 100 miles distant, and take perhaps seven years to determine it*. When justice is thus distant and difficult to get, few will be disposed, and still fewer able to sue for it; and the honest and peaceable subject will almost always be the loser. The prosperity of the county could not fail to be greatly promoted by any measure that could alleviate this evil†.

* The writer had occasion lately to see a letter of the following tenor, in answer to one craving payment of an account of long and forgotten matters: "If, as you say, you have been these seven years defending me in a process at the instance of A. B., of the C. sloop of Lorne, it is strange, that in all that time you never thought of letting me know what you were doing. If you had, I could have informed you, that A. B., of the C. sloop of Lorne, was dead five years ago; and that as he died bankrupt, none could be so hardy as to take up his quarrel."

The expence of recovering any ordinary debt, when messengers, &c. must be sent to such a distance, may exceed twice its value, and verify the account which Gulliver gives of the laws of his country, that a man may be ruined by gaining a few caufes.

Much good will arise from the late law, which gives to justices the power of determining all matters under 3*l.* 6*s.* 8*d.* It would be desirable to have their power still more extended, to the price of a cow or horse, or a servant's yearly wages (say 18*l.* or 20*l.*), so as to answer the ordinary transactions of the poor.

† "In Holland, burghers of established character, to whom the name of *Peace Makers* is given, are chosen to determine any claims, when the sum does not exceed 200 guilders (about 18*l.*)." *Howard's Account of the Lazarettus in Europe.*

"In the Scilly Isles, all civil matters are managed by what is called the *Court of Twelve*; in which the commander in chief, the proprietor's agent, and the chaplain, have their seats, in virtue of their offices; the other nine are chosen by the people. These decide, or rather compromise all differences, and punish small offences by fines, &c." *Political Survey*, Vol. I. p. 482.

SECT. VI.—*Expences.*

THOSE who have large possessions live well; those who have small ones live poorly. The small farmers, for nine or ten months in the year, make generally two, and sometimes three meals a-day of potatoes, with herrings or milk. Such as can afford it salt a cow in winter, and kill a sheep or two in harvest. Oatmeal pottage, or oatmeal jelly (*fowens*), make commonly the third meal a-day, with milk; and oaten or bear bread, when the potatoes fail, supply their place. In Kintyre it is customary to take some thin pottage, or a little bread and milk, before they begin work in the morning; and after dinner, should it even be potatoes and herring, or flesh and broth, they have commonly a little bread and milk, by way of desert or supplement. But neither of these customs are known in the other parts of the county.

In general most farmers live as they can afford; and as it would be difficult to find two farmers whose skill, industry, and attention, advantages and disadvantages, are the same, so it would be difficult to find any two whose expences exactly quadrate. Few ordinary farmers expect or accomplish more than to make their outlays and returns balance at the year's end. Of the manner of doing this an instance follows.

Outlays.

Rent,	-	-	-	-	-	L. 30
Wages of a man-servant in the house,	-	-	-	-	-	8
— of a maid;	-	-	-	-	-	3
Carried over,						L. 41

Would not some similar institution be of great use in all parishes, or at least in all parts that are remote from the ordinary seats of justice? Something is wanted to make the course of justice more expeditious and easy.

	Brought forward,	L. 41
Wages of a herd,	- - - -	1
Occasional aid in harvest,	- - - -	2
Stock, 4 horses, 36l. ; 10 cows, 40l. ; 1 plough and 4 harrows, 3l. ; 3 carts with furniture, 11l. ; dai- ry utensils and other furniture, 10l. ; in all 100l. ; upon which interest, risk, tear and wear, at 10 per cent. is 10l.	- - - -	10
Weaver and shoemaker, 3l. ; smith and carpenter, 3l.		6
		L. 60

Returns.

Bear, 18l. ; beans, 5l. ; potatoes, 7l.	- -	L. 30
Six of year old cattle, 12l. ; butter and cheese, 18l.		30
		L. 60

As much lint is sold as buys the wool ; and as much market yarn is sold as will purchase salt, candles, and a number of other little articles occasionally needed for the use of the family.—The farm contains about 40 acres of arable ground, with some pasture ; and might, under a different system of management, yield a considerable balance in favour of the farmer. See Chap. VII. Sect. 3.

The instance here given relates to the district of Kintyre ; and the returns are stated, not according to the high prices given at present, but according to the medium prices for some years past. In most of the other districts they generally turn but little of the rent out of the dairy or the barn. Their principal dependence is upon the sale of sheep and cattle ; which will fall to be considered elsewhere.

CHAPTER V.

IMPLEMENTS.

MANY of the proprietors have all the instruments of husbandry in great perfection; and as cart and plough-wrights are now established in most parts of the county, the tenants are also getting better implements than what were in use formerly. Still, however, many of them make their own ploughs, but generally in a very rude and clumsy manner, though they affect to say it is after the fashion of the old Scotch plough*. The machine itself may often be allowed to be a moderate draught for one of their horses: but light ploughs (on the construction of *Small's*) have of late been introduced among many of the farmers, as well as of the gentlemen, and answer

* The following, according to Dickson, are the dimensions of the old Scotch plough, and may be of use to those who work without rule. The length of the head, without the iron, 20 inches; breadth 5; goes into the sock 6. Mortises for the larger handle and sheath, 3 by 1. The sheath, forming an angle of 60 degrees with the head, is 12 inches between the head and beam, clear of the mortises. The larger handle 5 feet 4 inches long; its diameter at the beam and head 2 1-half inches. The handle curves at the beam, or about 10 inches from the head; the lower part is nearly parallel to the sheath. From the top of the handle to the bottom of the furrow, 3 feet 2 inches. Length of the beam nearly 6 feet; diameter at the thickest, 4 inches; perpendicular of the curve in it, near 5. Plane of the bolt hole above the plane of the head or bottom of the furrow, 15 inches. Sock, 2 feet long; or sock and head, 3 feet 8 inches. The plane of the coulter in the beam is where a perpendicular raised from the head falls: it is 2 feet 10 inches long, 2 1-half inches broad; the point of it a little before the sock, in a line with the left side of the head. The wrist is about 26 inches long, and 2 broad, and makes an angle of 30 degrees with the head. The lesser handle is a few inches shorter than the larger. The distance below depends on the position of the wrist, in which the lesser is fixed. The distance of the handles at top is 2 feet 6 inches. The mouldboard not straight, gradually projecting outward.

well, except on some coarse lands. On most lands these may be drawn with ease by two ordinary horses; which is a prodigious saving to the farmer, and paves the way for laying aside the driver, as a very few have already done.

Mr. Campbell, minister of Kilcalmonell, in Kintyre, has lately invented a plough, which, instead of a couler, has an erect plate of iron connected with the sock. The intention of this contrivance is to strengthen the beam, and to keep the plough from being choked in stubble ground*.

Harrows with timber teeth are still used by a few of the poorer farmers in some parts of the county; nor is the barbarous custom of tying them to the tails of horses (instead of drawing them by hems) entirely laid aside. Break-harrows and rollers are almost as yet confined to a few proprietors. The use of carts, where the roads and the ground admit of them, is nearly general. Those used by the farmers are for the most part of a small size, proportioned to the horses, and not well mounted, owing to the scarcity and high price of timber. They cost from 3l. 10s. to 5l., according as they are mounted. The ordinary height of the wheels is about 4 feet.

Peats and dung used to be carried on sledges, or on creels on the backs of horses; and the corn and hay was conveyed in small frames in the same manner. This is still the case in some parts where steep grounds and bad roads admit of no better conveyance. Fanners are pretty common; thrashing machines† not known. A few kilns with brick floors, for dry-

* A drawing of this plough (which obtained a premium from the Highland Society) may be seen in the Scots Magazine for 1794, and in the Encyclopædia Britannica, under the word *Plough*.

† In large farms these would soon pay the cost, not only by saving of labour, but also of the grain devoured by rats and mice, as all might be thrashed as soon as dry.

ing corn, have been lately erected in Kintyre; and the safety, cleanliness, and convenience of them, promise to make them soon more general. Where grain does not abound, such a kiln might be erected at the mill, and serve all the grain that is brought to it.

CHAPTER VI.

OF ENCLOSING.

Good enclosures are the foundation of all improvements. Whether lands are employed in tillage or in pasturage, enclosures are necessary in order to turn them to the best account. In arable lands they save the ground from being poached when wet, and put it in the farmer's power to raise green crops with much greater advantage than he can do without them. In pasture lands they save the expence of herding; allow the cattle to graze freely, without being teased by herds and dogs; and by giving them clean grass and a change of pasture as they need it, enable them to thrive better than they could do otherwise, and support a greater number on the same extent of ground. Enclosures are likewise of great benefit in the view of giving shelter to some grounds, and draining others, according to the nature of the grounds and the kinds of fences or enclosures. By judicious enclosures, most low-lying arable grounds might be made of more value, by at least one third, to the occupier, as well as of great benefit to the public, by increasing the quantity of corn, wool, flax, butter, cheese, butcher's meat, manufactures; and by means of all these articles of food and employment, greatly adding to the riches and population of the country.

In this county, enclosures, as yet, are chiefly confined to the possessions of proprietors; many of whom have sufficiently enclosed and subdivided the farms in their own hands. Many of the storemasters and graziers have also enclosed considerable portions of their lower grounds, which they save for winter and spring pasture. But the general appearance of the country is still naked and open; and must remain so, if landlords will not enclose them, or give their tenants longer leases.

The enclosures are of various kinds; stone dikes, earthen dikes, ditches, hedges, and half dikes, or sunk fences. Earthen dikes are so much labour lost. Of the other fences, the kind that should be chosen must depend much on the nature of ground. If that is soft and mossy, a ditch, 6 feet wide and 3 deep, is the most proper fence, as it may also serve to drain, and, perhaps, to water the enclosure. Both these points should be always attended to, as much as possible, in marking out the lines of all ditches for enclosing and subdividing grounds. Ditches may be generally executed at from 1s. to 1s. 2d. the fall of 6 ells*. Cuttings of willows, poplars, and other aquatics, should be planted in the face of them, when made, for the better fence, and for shelter: or plants of birch may be set at the back of them; which, as they grow higher and closer, will give better shelter, and make a fine appearance. They are easier got, and grow on poorer soil than beeches. They would probably grow well without any other trouble than sowing the seed on the back edge of the stuff thrown out of the ditches. The like might be done in the case of sunk fences, for the sake of shelter.

When the soil is good, hedges may be raised; and when they succeed, they make the most beautiful and most lasting fences†. But they are difficult to raise, on account of the protection and care which they require when young, and the quantity of timber requisite to raise them in, when timber is so scarce as it is in some parts of this county. Stone dikes are undoubtedly the best and most convenient fences, in a

* Nearly 6½ yards English.

† In order to have a good hedge, the quicks should be manured well, kept clean, never cut on the top, but only on the sides, in a sloping direction, like the side of a roof. Hedges alone make seldom a sufficient fence. A sunk stone fence, with a hedge behind it, would give both fence and shelter. Hedges would probably be more common in many parts of the county, if quicks were more easily got; but it is troublesome to get them from the low country, and few are at the pains of raising them from the seed at home.

country where stones abound almost everywhere, and where labour is cheap. In most places, they may be built from 4 to 5 feet high, at 1s. per yard. Besides, our cattle are so light and wild, that they can hardly be confined by any other fence. This is complete at once; stands, if well built, for a century; and when it fails, as the materials remain, may be easily repaired. It also takes up less room than any other; by which a considerable quantity of ground is saved. The Galloway dike, of which there are good specimens about Lochgair, is the best fence against sheep. The expence is nearly the same as of another dike of equal height*.

The size of enclosures must depend on the size of farms. In arable lands, it is requisite also to attend to the rotation of crops to be adopted, and to make the divisions of the land to correspond with this, and with the quantity of dung which the farm produces; upon which the rotation, in some measure, must depend. It should also be studied, as much as possible, to have the ground in every arable enclosure of the same quality; so as that the same management may suit every part of it: for, if some of it be wet, and some dry, it cannot always be ploughed and sown at the same time, nor admit of the same kind of crop, which may often prove an inconvenience. Even in grass lands, the soft should, as much as possible, be separated from the dry lands, and pastured in dry weather, when they will suffer least from poaching.

In this county, there are, properly speaking, no commons. But the open state of a great part of the country, and the mode of occupying farms by a number of small tenants conjointly, may be considered as little better. The Duke of Argyll has been, for a considerable time back, changing this system on his estate, by dividing the farms, and giving each

* "A Galloway dike, 5 feet high, 32 inches at bottom, 16 at top, is built, according to the distance of stones, at from 4s. 6d. to 7s. 6d. per fall." *Tweeddale Report.*

tenant his own share separately. Others have begun to follow this system; by which the lands are better improved, and the tenants in better condition. His Grace makes it also a covenant in most of the leases which he grants, that the tenant shall enclose so much ground, or build a certain extent of dikes. This makes sometimes a part, and sometimes the whole, of the augmentation put upon the rent. Thus the tenant is benefited in the meantime (as the work must be done within a few years after the commencement of his lease), and the land is improved, so as to bear to have the rent raised afterwards. His Grace also furnishes his tenants with thorns *gratis*; but they are not always well cared for after planting. Some proprietors enclose the lands themselves, and charge the tenant sometimes 6, but more commonly 7 1-half per cent.* for the money expended. In whatever way, or at whatever rate, it is expedient that lands should be enclosed, either by the tenant or landlord, or both; as, without this, no considerable improvement is to be expected. Green crops, especially, cannot be raised to advantage without enclosures; and without green crops, farming hardly deserves the name; for the land must be unproductive, and the cattle, for a great part of the year, starving. It is unnecessary to add, that whatever makes land more productive, will be friendly to population.

Gates, in such enclosures as we have, merit no particular notice, except those about Inveraray, which are remarkably neat and light. Each pillar consists of one block or stone, neatly cut; and the gate shuts with a spring, which goes into an iron niche, that holds it fast.

* "Five per cent. is plenty." G. C. It is indeed hard, if lands cannot be improved under double the profit which is generally had from buying them. Five per cent. for improvements is the same as buying an estate for 20 years purchase, besides being free of taxes.

CHAPTER VII.

ARABLE LANDS.

SECT. I.—*Tillage.*

IT is too common a notion, that any man may hold a plough; yet much depends on the skill of the ploughman. On this depends often the difference between a good and a bad crop; and always the difference between the cattle moving with ease and with difficulty. With us, this work is too often committed to unskilful hands, who rather tear than till the ground. We have, however, improved much within these 20 years; although, as yet, the improvement is far from being general. Many of our proprietors brought skilful ploughmen from the low country to carry on their farming operations. A number of our young men hire themselves occasionally in the low country, and bring home the skill which they acquire there. Some farmers from England were also brought by the Duke of Argyle to his estate in Kintyre; and their skill in ploughing could not be questioned. Owing to these different causes, we have, in all parts of the county, some specimens of as good ploughing as can be seen anywhere; and as our people are abundantly sagacious, we may hope that this improvement will soon be general.

Some, instead of four, have begun to use only two horses in the plough. As our land, in general, is light and friable, two tolerable horses, kept in good condition, with a light plough, could easily turn the most of it, and make better work. A very few have also begun to plough without a driver. This, upon trial, will be found easier than is commonly imagined. In a very few days the horses come to understand their business, and will give little trouble to direct

them by the reins. They also move with greater ease, and make better work, even in crofs and irregular lands. It is furprising, that such as see so vast a saving, and so great an improvement going on before their eyes, are so slow to adopt it. It cannot be supposed that this inattention to their interest will long continue. The ploughman who will not do without a driver, must soon be considered as unfit to be employed. The keeping of more horses on a farm than are necessary, is a common case; and the loss is prodigious: for every unnecessary horse, the farmer could keep two cows, which would bring him a gain of gl. a-year .

In some parts of the county, the old mode of ploughing with four horses abreast, and the driver walking before them backwards, is still continued. But this awkward mode is fast going out of fashion; and it may be expected, that, in a few years, it will be altogether unknown.

Many of our old ridges are in the serpentine style, and answer the description of Hogarth's line of beauty. But the taste is changed; and new ones are made straight, though the direction of the old cannot easily be altered. To change the form of such ridges, especially when they are broad and high in the middle, requires much skill and caution. It can hardly be done with the plough, without burying a great part of the best soil which is near the surface, and bringing up, instead of it, what has lain beyond the reach of the sun and air for ages. If it is attempted at all, it ought to be done with the spade, except making first a small ridge with the plough, in the old furrow, which will greatly lessen the labour. After this, one should begin at the end of a ridge, levelling a few feet from side to side, then covering this bit with the surface of the next; after which, the piece from which the surface was taken, is levelled, and covered in the same way with the surface of the next; and so on, till the ridge is done; always taking care to keep the earth over the old fur-

rows a little higher than in any other part, as it will sink more afterwards. The expence of this operation may be reckoned near 3l. an acre; but the pulverizing and trenching which it would give the ground, when properly executed, would bring a speedy gain, and leave a lasting improvement.

When new ridges are to be formed, they should be made as straight as possible, and in a north and south direction, when the ground will allow it, that both sides may have an equal share of sunshine*. They should be of a moderate breadth, never exceeding 12 feet when the ground is dry, and much narrower when the ground is wet. They should be raised no higher in the middle than is requisite to let the water fall off to the furrows; except in mossy grounds, where the furrows may be intended for open drains, and where it may therefore be expedient to make the ridges higher and broader.

The depth to which ground should be ploughed must depend on the soil, and sometimes on other circumstances, which may require the ground to be ploughed sometimes shallower, and sometimes deeper. In general, it should be from 4 to 6 inches deep; and the sod or fur, in order to turn easily, and keep from falling back, should be a third broader than its depth; and the breadth should be uniform, in order to make the work look neatly when it is done.

In Lorne, after the ground has been ploughed, it is customary to run over it all with the spade, and to break the clods so minutely, that it has much the appearance of ground that has been dug or delved. This corrects any fault in the ploughing, makes the seed fall more equally, and keeps any of it from going to too great a depth between the furs. The expence of this operation is so trifling, that it may be almost

* Some prefer an east and west direction, by which the furs are more directly exposed to the meridian sun.

saved in the seed, besides the difference which it makes in the harvest. If the practice were extended to some of the stiff grounds in Kintyre, it could not fail to be of great advantage. Any ground that is not sufficiently pulverized, requires a liberal use of the spade; and for that use it will always make a liberal return. In many farms in this county, whole acres, where the plough cannot run, are turned up with the spade altogether; and the produce is considered as so much greater than that of ploughed land, as to pay for the difference in the labour.

SECT. II.—*Fallowing.*

In this county fallowing is hardly known. The farmer cannot be reconciled to the thoughts of having a field a whole year without any grass or corn; though it would return him double the next year, and save a year's seed to the bargain. We have indeed, comparatively speaking, but little of strong clay soil that requires to be pulverized; and if green crops were raised in more abundance, and managed by the horse-hoeing husbandry, our light lands might be cleaned, and a profitable crop obtained at the same time. When a cleaning and non-exhausting crop will stand instead of a fallow, it is no doubt to be preferred: but on what we have of stiff heavy soils, especially in Kintyre and in Craignish, fallowing might be of service; and the more so, if we begin to raise wheat; which answers best after a fallow, though it may do well after potatoes, and especially on clover ley.

The purposes of fallowing are, to pulverize the soil; to enrich it by exposing a new surface repeatedly to the influence of the sun and air; and to clear the land of the roots and seeds of weeds. Three ploughings (of which one should be across), and as many harrowings, well-timed, and judiciously performed, will make an incredible change upon a field that

requires to be fallowed. To clear it of root-weeds, the work should be performed when the weather is so dry as to wither them; but seed-weeds, or annuals, are sooner destroyed in moist weather, that will make them vegetate quickly; after which they should be ploughed down, and the operation repeated till the field is clear of them. Weeds, at all events, must be destroyed before any good crop can be expected; and when this is not done by green crops, it ought certainly to be done by fallowing. If our farmers could be persuaded to make some few and small experiments of this improvement, upon very stiff or foul grounds, they would see the advantage of it. But on light lands, not greatly infested with root-weeds, any green and meliorating crop, well drilled and hoed, will be of more advantage. The state of nurseries and garden grounds, constantly in cultivation, and constantly productive, seems to indicate, that if land has every other justice done to it, fallowing may generally be dispensed with; if green crops are put in drills, the interstices horse-hoed, and the weeds that escape the plough picked out by the hand.

SECT III.—*Rotation of Crops.*

A JUDICIOUS rotation of crops is a matter of the highest consequence in husbandry. Lands properly managed in this respect will, in a number of years, produce the double of what they would otherwise yield. Every plant seems to have some food peculiar to itself, of which it will soon exhaust the ground if repeatedly sown on the same spot. The seldomer, therefore, that the same plant is sown on the same ground, the greater will be the increase. Hence the great return of oats from new land when properly cultivated, and the great return of bear from land that is suited to it, and in which it was not sown during a long period before.

Some crops too impoverish the ground more than others.

so that a due intermixture, or rotation of them is necessary, in order to keep the land from being exhausted. Of the first kind are all white crops or culmiferous plants, such as wheat, oats, bear, and rye; and of the latter kind, are all green crops or leguminous plants, such as pease, beans, clover, and cabbage. The first having small leaves, and few in number, must depend mostly on the soil for their nourishment; and little on the air; especially when their leaves harden, and when they begin to perfect their seed. The latter, on the contrary, having large and abundant leaves, fresh and green till they are cut, derive more of their nourishment from the air than from the soil. This too is the case with potatoes and turnips, which no cultivation could bring to perfection, if they should be deprived of their tops. Their bulbous roots also keep the soil in motion, and help to pulverize and make it fertile. It is manifest, therefore, that the white and exhausting crops should not come close upon each other, without the intervention of some of the green.

Besides changing the crop from white to green, it is also necessary to adapt each to its proper soil. Oats will answer almost on any land; but bear requires it should be dry and free. Beans answer best in land that is strong, moist, and deep; pease, in that which is light and dry. So that the farmer must beware of putting any crop in a soil that does not suit it.

In the rotation of crops, regard should also be had to make the different kinds succeed each other, so as to furnish work at every season, but without interfering the one with the other. The soil, climate, season, nearness or distance of market, much or little dung, fields being enclosed or open, with several other circumstances, all tend to vary the rotation, as the judgment of the farmer shall direct him. The period of rest, in pasture, must depend upon the quantity of dung. The more the farmer abounds in dung, the oftener he can turn up his ground to advantage.

Examples of a proper rotation are as yet rare among the farmers of this county. The only green crop that is generally cultivated is potatoes. Grasses are cultivated by a few, and in no great quantity. The quantity of beans, pease, and turnips, is also inconsiderable, and confined chiefly to the district of Kintyre. According to the system which lately prevailed over all Scotland, the land is generally divided into infield and outfield. The ordinary rotation on the first (which receives most of the farm-yard dung) is potatoes, bear, oats, oats, and then perhaps beans, bear, oats, while it is thought to pay for seed and labour; after which it sometimes rests a year or two, before the same course is run over. In the outfield, which, in most of the county, is manured by folding cattle upon it, and in the rest of it by lime, and some dung, moss, or compost, the usual rotation is, three successive crops of oats, and then three or four years rest before the same operation is renewed.

It will easily be conceived that this system of husbandry must be very unproductive, as in fact it is; for the average returns of the county cannot be reckoned so high as three for oats, and five for bear. The errors are obvious. In the *first* place, the farmers plough perhaps twice as much as they ought. Of course they can do the land but half the justice it would need; so that they diminish the grass without adding to the quantity of corn. Then, as they have seldom any green crop, except potatoes, they exhaust the ground by a succession of white crops; never less than one of bear, and two of oats, on the infield, and three of oats on the outfield. What beans they sow, are sown broadcast, and never hoed; so that they seldom do much service to the ground; as, when thus sown on exhausted ground, they rather encourage than check the weeds. At length, when the land is quite exhausted, and will no longer pay for seed and labour, it is allowed to rest in a state in which it can hardly produce as much grass per acre as would feed a sheep.

In order to rectify these errors, farmers should begin with ploughing, perhaps, no more than half the usual quantity. Some of the poorer fields that are distant, on high and hanging grounds, should perhaps be entirely given up; at least any farther than is necessary to make them good pasture. With this view they should be turned up once in the seven or eight years, after being previously limed or manured; only one crop taken, or at most two, and then laid down with white clover, and other suitable grasses. If, in any farm, this should occasion a scarcity of arable land, lower and more level grounds may be cultivated, to supply the deficiency. Such grounds, at a moderate expence, will give a much better return.

Whatever lands are in tillage should be treated with equal justice, and as nearly in the same manner as their nature will allow. With this view, the distinction between infield and outfield should as much, and as soon as possible be abolished. The best and easiest way of doing this, is by dividing the farms, and separating the farm-houses which lie together, so that each may be near the centre of the arable land which belongs to it. In this manner all would become infield, and there would soon be no such thing as outfield. The Duke of Argyle has been for many years carrying on this system on his estate in Kintyre; and it has been attended with the happiest consequences. The land is better improved, and the tenants are in a better condition. When every one has thus his own division, and all contiguous to him, a farm is made to produce more than the double of what it did under the old *run-rig* system*.

As much of our land is at present in a poor exhausted state,

* As a difference in the soil, and a regard to natural divisions, rendered the shares sometimes unequal, the tenants themselves were allowed to put so much of the rent of the farm upon one share, and so much upon another, as they judged to be their relative value, and then to cast lots for them. Or, if they differed in opinion about the value of any lot, he who offered the most for any lot, was allowed by his neighbours to take it at his own valuation.

some speedy and effectual method should be taken to recover it. For this purpose a fallow might be of essential service. But what promises to be still more beneficial, in any ground that suits it, is to sow it with pease, and to plough down the crop when in blossom. This would immediately supply the land with a stock of that vegetable food of which it has been drained by severe cropping. After this it should be made a rule, never to take two corn crops in succession *, but to fix on such a rotation as will in every field allow of alternate crops of white and green, whatever may be the particular kinds.

Care must also be taken to let the ground rest, while it is yet in good condition: for, if its strength is greatly exhausted, it will be difficult to restore it to fertility. Time, by the kindness of Providence, will no doubt effect the cure, but it will do it only after a long period of barrenness. It is better then to stop betimes, and to lay down the ground in good heart, with grass seeds, either for hay or pasture.

The above general hints may suffice to direct the judicious farmer to a proper system of rotation; but it may perhaps be necessary to be more particular, in order to convince him how much it is his interest to attend to them. For this purpose, a mass of evidence might be adduced from many parts of the kingdom. Ayrshire, for instance (which in soil and climate resembles much the lower parts of Argyleshire, as may readily be supposed from only the Frith of Clyde intervening), was about 30 years ago no farther advanced in agriculture than we are at present; but now agriculture is brought to as great perfection in that county as in any part of the kingdom. Some intelligent landlords began with a regular and judicious rotation, in hopes that their tenants would follow

* "Two white crops would give a check to good rich land, but to poor land would be absolute ruin." *Agricultural Report of Radnor.*

their example; but tenants are generally tenacious of their old customs, and imagine that what they see done well by gentlemen is done at a great expence, and that therefore they ought not to attempt it. In this case the landlords wisely obliged them by covenant to plough no more than one third of their arable land in any one year, nor the same land more than three years successively; to sow a certain quantity of grass seeds with the third crop; to mow the grass one year, and to pasture it for five. The tenants considered these restrictions as very grievous, till, contrary to their expectation, they saw that their crops, instead of being diminished, were greatly increased, and that the hay and grass alone were of more value than the whole produce of the farm before*. The advantages of this new system were so manifest, that it soon became general, and still prevails in Ayrshire. Nay, some carried it still farther, and instead of allowing their tenants to plough a third, restricted them to a fourth; and it is said the crop was still as large as before; as was the case with the ancient Roman, who, after repeatedly sharing his possession with each of his three sons, found the produce of what he had to be still the same.

If the landlords of this county would enjoin, or rather if they could persuade their tenants to follow some such plan as the above, so far as the soil and season would admit, it would be productive of the greatest good. It has indeed been objected to the Ayrshire plan, that as it allows the tenant to break up the ground but twice in 18 or 19 years, the ordinary term of a lease, he may become careless during the last course, when he cannot look for the full benefit of his improvement. If this objection shall be thought to have

* Agricultural Report of Ayrshire.—Statistical account of a parish in Fersar (IX. 136.) says, "A third, or certainly less than half the same farm, yields more, and better grain, than the whole did 30 or 40 years ago."

much force in it, the term allowed for pasture might be shortened, without much injury to the land or to the landlord. When the tenant is restricted, or rather advised *, as to the quantity he ploughs, and the number and kind of crops which he takes, the land cannot be run out, although the period of rest should be shorter. Yet it is doubtful whether the farmer would be a gainer by this measure, as land pays so well for at least a reasonable time of rest, by giving better crops afterwards, and yielding in the meantime good pasture, with no expence or trouble.

A few years ago, a proprietor in this county, wishing to convince his tenants of the advantage of laying down their ground in heart, and giving it longer rest, took one of their fields, which was contiguous to him, into his own hands, and after manuring and dressing it well, laid it down with grafs seeds, and pastured it for five years. When he began to turn it up after this rest, the tenants, struck with the rich appearance which its mould had assumed, requested to have it back, which he told them they might, at 20l. for that year, or 15l. per annum for four years. They chose the latter; and the first crop was so rich, that after they had cut it down, he told them he would give 40l. for it. Had it been in tillage during the five years it rested, it would not have yielded so much, besides seed and labour; so that all the pasture got from it was so much clear gain.

* Any absolute restrictions upon the farmer can hardly be recommended, even if they should appear to be for his interest, as so much depends upon soil, season, market, manure, and other matters, that he must be often directed by circumstances, and in many things left to exercise his own judgment, and to follow his own discretion. A few instructions and a few examples may convince him that his own interest, as well as that of the landlord, is promoted by attending as much as possible to a regular rotation. Towards the end of a lease, however, some restrictions may be necessary to prevent the tenant from running out the ground.

But in order to place the difference between the present and proposed system in a still clearer point of view, let us suppose a farm of 48 acres arable, managed first in the one way, and then in the other. The returns, it is believed, may be fairly stated as follows :

First State.

18 acres under oats, 3 bolls per acre, at 16s.	L. 43. 4
{ 3 do. potatoes, at 9l. per acre, - -	27 0
{ 3 do. beans, at 3l. per acre, - -	9 0
6 do. bear, $4\frac{1}{2}$ bolls per acre, at 20s.	27 0
18 do. ley, at 5s. per acre, - -	4 10
48	L. 110 14

Second State,

$5\frac{1}{2}$ acres oats, 6 bolls per acre, at 16s.	L. 25 12 0
{ 3 do. potatoes, at 12l. per acre, 36 0 0	
{ $2\frac{1}{2}$ do. beans, 6 bolls per acre, at 16s. 10 4 0	
$5\frac{1}{2}$ do. bear, 6 bolls per acre, at 20s. 32 0 0	
16	103 16 0
$5\frac{1}{2}$ acres hay, at 4l. - -	21 6 8
$26\frac{1}{2}$ do. pasture, at 20s. -	26 13 4
48	
Add saving of seed and labour on 14 acres, 21 0 0	
	172 16
Difference in favour of second state, -	L. 62 2

Here the produce of 16 acres in the last state is nearly equal to that of 48 in the first ; and the hay and grass, with all the advantages of beef, mutton, butter, cheese, and dung, attending them, is so much clear profit, which may be cheaply estimated at considerably more than 62l. 2s. as above. Yet

the return in the first is stated rather higher than the average of this county, and in the last it is stated a great deal lower than the average produce of those places in which the new system proposed is observed*.

It is true, this system cannot be followed to the best advantage till the land is first enclosed: but as that is likely to take much time, green crops might in the meantime be raised, though with less advantage, and the cattle winter-herded. This would infer little trouble, in a great part of Kintyre especially, where they are generally all housed at night. Green crops are raised in great quantities in the neighbourhood of Aberdeen, on ground mostly unenclosed.

Upon the whole, the proper management of arable lands

* In Ayrshire it is usual to have 10 or 12 Winchester quarters (or nearly Kintyre bolls) of oats, and 6 or 8 of bear and beans, per acre; and from 16l. to 20l. worth of potatoes. *Agr. Rep.*

The effects of a judicious rotation are still more manifest in some parts of Perthshire, on the other side of us, where they have on clay soils, 1. Fallow, with lime and dung; 2. Wheat; 3. A green crop; 4. Bear; 5. Clover; 6. Oats; and on light soils, pease instead of beans; and where the return is from 8 to 10 bolls (Linlithgow) of wheat and bear, and from 10 to 12 of oats and beans, per acre. *Stat. Acc. XIV. 218.*—Here, as there is no rest, the more must be ascribed to rotation, although much must always depend on manure, and skill, and pains, in the cultivation.

The following rotation, also without rest, except sometimes perhaps a fallow, has been successively practised in other parts of the same county. "The land is enclosed and divided into 4 parts: the history of one is the history of the whole. 1. A summer fallow, if the ground be foul; or, if clean, pease, potatoes, and turnip; 2. All the dung of the farm, with barley and grass seeds; 3. Grass; 4. Oats; then recommence. By adhering to this plan, the oats have already yielded the 12th, and the barley the 16th return; and as no two white crops immediately succeed one another, the ground can never be exhausted." *Stat. Acc. IX. 249.*

A few in our own county who have begun to raise green crops, and attend to a proper rotation, have already doubled their returns. By this means Mr. Lamont of Knockdow gets from 8 to 10 bolls of bear, and from 6 to 8 of oats, from the acre. *Stat. Acc. V. 466.*

may be comprehended under the following general heads :

1. Lay the lands dry, by proper furrows, drains, or by the application of sand, or other corrective substances ; according as the wetness proceeds from rains, springs and wet bottom, or from a spongy surface.
2. Keep it clean by fallowing, or fallowing crops, hoeing, and weeding.
3. Keep it rich by manure ; to which green crops are most conducive.
4. Attend to a proper rotation of crops ; white and green alternately ; and these varied according to the nature of the soil ; to which the crop, and even the manure, should always be suited.
5. Sow all seeds only when the ground is moderately dry ; especially if it be clay soil, which, if possible, should not even be ploughed when it is wet.
6. Change frequently the seeds of all kinds of grain and roots, as otherwise they will soon degenerate.

SECT. IV.—*Of the Crops commonly cultivated.*

THE kind of grain that is raised in greatest quantity in this county are oats, as they grow in poor exhausted soil that would yield no other crop. The quantity raised, however, is not equal to the consumption of the county. About 25,000 bolls of oatmeal may be yearly imported to the continent of Argyle. But if the land were properly cultivated, and the arable part of sheep farms kept in tillage, the country might probably spare as much as it now needs, or support a much greater number of people. Oatmeal used to be the principal food of the inhabitants : but of late the bulk of them live mostly upon potatoes ; of which they commonly take at least two meals out of three, in the day, for nine or ten months in the year.

Till of late, the small black oats was the kind generally sown. Now it is mostly given up, except in some mountainous farms, where it is raised chiefly for feeding out-lying

cattle in winter. For this purpose it answers well, as it is easily carried, and the grain adheres firmly to the stalk, which is not so coarse as that of other corn. Of this corn it took 2 1-half bolls to make one of meal. Some say it took more.

The Blainfley oats are the most common kind in use at present. As they come from a poor cold soil, their condition is rather meliorated in this county, and they succeed well: for vegetables, like animals, will always thrive when brought from worse to better soil or climate. It is probable, however, that almost all the money sent out of the county for this seed might be saved, by raising seed in the high and hilly parts of it, and bringing it from thence to the low parts along the shores. Hardly any two counties in Scotland differ more in soil and climate, than the higher and lower parts of this county differ from one another.

Polish oats were used much a few years, and answered well, especially on clay, or wet mossy ground; as the thickness of their husk would save them where other oats would perish. But they were found to be apt to shake, if not cut down before they appeared to be fully ripe; which the farmer was unwilling to do; and therefore he often suffered. They are sown, therefore, in less quantities than they were; which, perhaps, they ought not, as they suit low mossy grounds, ripen early, and yield a great quantity of meal. The loss of cutting them before they appear to be quite ripe, is not considerable; as all grain continues to ripen for some days after it is cut, till all the sap in the stalk is dried up. On poor soil, however, they do not thrive so well as the Blainfley.

The red (or Peebles) oats have been lately introduced by a few gentlemen; and, so far as they have been tried, have answered well. They seem to agree with the soil and climate, ripen early, meal well, and are not apt to shake.

All kinds of seed, especially oats, require to be frequently

changed; without which they will soon degenerate: White oats sown for a number of years on the same ground, will not only become smaller, but much mixed with black, being impregnated, perhaps, with the farina of black oats in other fields. When it is not convenient to renew them by bringing a change of seed from a distance, it will be of use, if they can be got clean, to take them from any farm of a poorer and colder soil in the neighbourhood; or even in the same farm, when, as is commonly the case, there are fields of very different soils, to change the seed of the one to the other, that is of an opposite quality, will be of great service. In ground that is newly cultivated, seed keeps longer from degenerating, than in ground which has been long in tillage; which ought to be a considerable motive for bringing more such ground, from time to time, into cultivation.

Bear, or *bigg* (improperly called barley), requires a soil that is dry, mellow, clear of weeds, and well manured. It is raised in large quantities, and with great avidity, on all lands supposed to be in condition to bear it. Indeed, the great object of the farmer, especially in the lower parts of the county, is to raise as much of this grain as he can, as it always finds a ready market for the use of the distiller. This tempts him often to sow it on land so ill prepared to receive it, that it yields a very unprofitable crop. It is generally sown after potatoes, and also after beans (where beans are raised), with such manure as can be afforded after serving the potatoes. If a great part of the ground thus allotted for bear were put under oats, it would certainly turn to more account; as the land that will not give five returns of bear, would give more than seven of oats. This, too, would supersede the necessity of our importing almost any meal into the county; and make us still greater gainers, by lessening our quantity of whisky: for this horrible enemy to

life *, to health, to food, to industry, and to virtue, will get almost all we can raise of it, whatever may be the quantity.

In many parts of the low country, where farming is better understood than here, oats, and not bear, is what is always sown after potatoes. A few have occasionally followed this practice here, and found their interest in it. Oatmeal will always find a ready market, as well as bear. The only difference is the trouble and expence of manufacturing it. This prevents even some of the bear from being made into meal oftener than it is : for the mill dues upon bear are often a 12th part, when upon oats, they are but a 16th or 20th. But supposing the medium charge on both grains to be only the last, is it not too heavy a tax on the farmer to give a 16th or 20th of his whole crop to the miller † ? Till farmers get grinding as well as thrashing machines (which, in an age of so much science and ingenuity, may soon be expected ‡), this burden might be lightened, and the servitude of thirlage every where abolished, since the machinery of mills is so much improved, that they can now dispatch as much work in an hour as formerly in a day.

Landlords should unite in doing all that can be done to

* The poet observes, that it is

“ Strange that a man

“ Should put an enemy into his mouth

“ To steal away his brains.”

But the enemy is not always satisfied with the brains: he often makes the whole body his victim, and even extends his power to this victim's progeny. A late writer, after observing that distilled spirits check the growth of the human body, justly remarks, that “ the inhabitants of the mountains of Scotland have fallen much short of the stature and robust habit of body of their ancestors, within this last century, during which they have been acquainted with the still.” *Macpherson's Introd. to Hist. of Brit.*

† In Ayrshire, the expence of drying and grinding oats is only 6d. per quarter (nearly a Kintyre boll). *Ayrshire Report.*

‡ Mills to grind by means of a horse, and by the hand, have lately been invented in England, and may probably be brought soon to such perfection as to be fit for general use.

encourage the raising of oats in preference to bear, and to the manufacturing of bear into meal instead of whisky. This would be a mean of making 15 or 20,000*l.* that now go out of the county every year for meal, take another course, and circulate mostly into their own pockets. It would also check an evil that is growing at an alarming rate, and preserve the health, industry, and sobriety of their people.

But it is to be regretted that many landlords discover a very high degree of inattention, and a very short-sighted policy in these matters. They are too much disposed, in general, to favour distilling and dram-houses; and, when acting as justices of the peace, they are seldom inclined to inflict due penalty on those who follow these occupations without a licence. They say, that distilling should be encouraged, as it will bring the tenant a good price for his bear; and imagine, that a man who keeps a dram-house will be able to pay a better rent than he could do otherwise. They do not consider, that all the grain made into whisky is as much lost to every useful purpose as if it were cast into the sea; that the money which it brings to the distiller, and from him to the tenant, is, in fact, a heavy tax upon their estates (upon which the liquor is consumed), and that, if it were not for this, the money so spent would have been laid out in improving the land, and bettering the circumstances of the inhabitants, after which it would have found its way to the landlord with accumulated advantages, as the price of meal and other useful commodities furnished by his lands. The landlord who encourages a still or a dram-house, puts it perhaps in the power of one to pay him a few pounds more rent than he could do otherwise; but in doing so, he may put it out of the power of 50 or 100 others to do him or themselves that justice which they could have otherwise done with ease; and thus he may lose a hundred times more than he gains.

A landlord in Kintyre, a few years ago, allowed a miller on his estate and in his neighbourhood to keep a dram-house, as smiths and millers too often do, to the great prejudice of tenants and all around them. The quantity retailed in this dram-house (as the writer was informed by the furnisher) was a 20 pint cask in the week. This, at 2d. the gill, will amount in the year to 138l. 13l. 4d. It is moderate to rate the loss of time and industry at the like sum, and to state the whole loss at 277l. 6s. 8d.; and as it was a place of little resort, almost all the liquor must have been drunk by the gentleman's own workmen and tenants. He saw his work neglected, and his workmen in rags; and, at the end of the year, put a stop to a practice which would have soon beggared half the neighbourhood. All landlords would follow the same course, if they would duly consider their own interest, and the evil consequences of these shops of poison.

Bear, when well manufactured, makes good wholesome and palatable bread*; but a harsh and unwholesome spirit. But the greatest evil of this spirit is, that it possesses, it would seem, more than any other liquor, the dreadful quality of creating a quick and strong habit; which, like the use of tobacco, excites an uneasy craving, that leads to excess and depravity, and often ends in death. The wisdom of our senators could never be better employed than in devising some means to put a stop to the alarming progress of this horrid evil over

* "Among the Romans, barley (or bear) bread was the food of gladiators, to give them strength; it was also a favourite of the Greeks, and Hippocrates has written in its praise." *Pinkerton's History*.

It is remarkable, that bear, in some of the higher and more inland parts of the county, renders more meal than in some of the lower parts along the shore. The writer has met with a similar observation in some *statistical account*, where the fact was accounted for from the grain's ripening and filling more slowly on the higher and colder grounds.

all the kingdom. Raising the duty upon whisky almost to a prohibition, and taking off that upon ale, might occasion perhaps some diminution of the national revenue, but make a vast addition to national virtue, industry, and good order.

The temporary stop put to distilling this year, in consequence of the alarm of a scarcity, has been attended with such happy effects, that every good citizen would wish it were stopped for ever, or at least laid under severe restrictions. Many districts which formerly wanted bread, have at present enough, and to spare. Above 20,000 bolls have been yearly converted into whisky on the continent of this county. One half of this evil fell to the share of Kintyre, and above a third of it to the parish of Campbelton, which used to distil near 8000 bolls. The loss of so much bread is, however, a light evil, when compared with all the other mischiefs that must follow the drinking of more than *half a million* Scotch pints of what has been properly termed *infernal liquor*. Landlords and legislators, unite your efforts, and check, ere it be too late, this enormous and increasing evil.

Potatoes have been long and much cultivated in this county, where they may be well said to be *the staff of bread*; for most of the inhabitants live chiefly upon them for more than three fourths of the year. Of late they have learned to keep them fresh and good all the year round, by laying them up dry in winter, and by spreading them in the end of spring on a clean floor, and frequently turning them to prevent their growing. There is no better way of using them than in their natural state; but for the sake of variety, a part of them, before they begin to grow, may be converted to *farina* or meal, and used in bread*.

* The following receipt for making potato bread was lately published by the Board of Agriculture.

To obtain the meal of potatoes is a simple and easy process. The potatoes are well washed, and grated down to pulp, either by a grater, or in a small hand mill, such as is used by many for peeling off the skin. This pulp is then put into a hair-sieve, and repeatedly mixed with cold water, till the strainings are clear, and the fibrous part perfectly divested of the farina or mealy substance. The fibrous part may then be set aside for the use of hogs or cows, and the strained liquor suffered to settle, after which the brown coloured water is poured off, and fresh water afterwards repeatedly mixed with the sediment, and poured off after it settles, till the water comes off perfectly clear. The sediment (of which the purest will be at the bottom) is then sufficiently dried by the sun, or in an oven; and as soon as may be, to prevent its fouring. When thoroughly dry, and put in a bag near the fire, or in any dry place, it will probably keep for years, being in every respect the same as starch. The quantity of meal thus obtained, will in some measure depend on the kind of potatoes, one kind being more mealy than another. In general one pound of meal may be got from seven or eight of potatoes. An equal half of this meal (or even a third) mixed with wheaten flour, and fermented with yeast,

"To any given weight of flour, add half the weight of potatoes. Let the potatoes be well boiled, peeled, and mashed. Mix them with the flour whilst warm, then add the yeast, and proceed as in the common method of making bread, making it up as dry as possible."—18 lb. of flour made 22 1/2 lb. of bread; 18 of flour, and 9 of potatoes, made 29 1/2 lb. Of the flour, three parts were of wheat and one of barley.

* The following receipt for making yeast has appeared in several publications.

"Boil potatoes (the mealy kind the best) one pound for every quart of yeast you wish to make. When boiled, skin and mash them. Mix as much of the water in which they were boiled, as will reduce them to the consistency of yeast. Then, for every quart of yeast, put in two ounces of the coarsest brown sugar, and, when in a lukewarm state, two or three table spoonfuls of good new beer yeast for each pound of potatoes. Keep it stirring and

makes very fine and cheap bread. The white of a few eggs may be added to make it rise the better. The meal of potatoes may also serve instead of flour in all kinds of pastry work.

The farmers generally raise their potatoes in drills, and the poor (who have neither horse nor plough) in lazy beds. The largest potatoes are commonly chosen for seed, and cut with atleast one eye to every set. Near two bolls (10 barrels) of seed are allowed for the acre, when the potatoes are large, the return is commonly from nine to twelve seeds; but sometimes, though rarely, fifteen or sixteen. They are planted in the end of April or beginning of May, and taken up in the end of October when the crops are withered.

The seed of potatoes requires to be frequently changed, as after a few years they are neither so large nor so prolific; though they are better tasted than when first introduced. They may, however, like other plants, be kept the longer from degenerating, by planting them often in new ground, and shifting them from that to what has been long in tillage, and *vice versa* *. The kinds are continually shifting.

" warm for 24 hours, or till it has done fermenting, when it will be fit for use; but if older the better. It will keep in bottles for several months."

* Whether the prolific quality of potatoes, when they degenerate, can be renewed or increased by raising them from the seed or apple, is a question about which there are very different opinions, and must be decided by further experiments. The only one made by the writer was far from answering his expectations. But as the matter deserves to be better ascertained, it may be proper to give the following directions (from the *Georgical Essays*).

" Take a bunch of the potato apples when ripe. Hang them up in a dry warm place during winter. In February, separate the seeds from the pulp, by washing the apples in water, and pressing them with the fingers. Then dry the seeds upon paper. In April sow these seeds in drills, in a bed of earth well prepared. When the plants are about an inch high, draw the earth up to them with a hoe, in order to lengthen their main roots. When they are about 3 inches high, dig them up with a spade, and separate them carefully from each other. Then plant them out in a piece of fresh ground well manured and trenched, leaving about 16 inches from one plant to another.

The most common at present are, the Scotch-gray, the lady-white, and pink-eye. The properties of good potatoes are, to be numerous, large, clean and dry; to ripen early, and to keep well.

The disease called the *curl* has not yet seized our potatoes in this county; owing probably to our changing the seed so often, and planting much of it in new mossy ground; which in other parts is found to be the best preventative. This should be a strong motive for the improvement of waste grounds.

We have got some of an early, and some of a late-kind of potato, which is not apt to shoot even in the beginning of summer. When these shall become more common, they will help to make the two ends of the year meet with more ease than at present.

Our potatoes are most commonly planted on poor ground, after a crop of oats. The ground is first ploughed in winter or early in spring*, and again a short time before it is planted. It is also twice harrowed in the intervals. Before the potatoes are planted the ground is formed into drills, from thirty to thirty-six inches asunder; the dung is laid in the furrows between them, generally over, but sometimes under the sets, which are placed from six to eight inches distant†. The drills are then split to either side, and the new drills formed over

"ther. As they advance in growth give them one or two hoeings. By this management, the potatoes will in one season come to the size of hen's eggs, and the haulm will be as vigorous as if sets had been planted."

"Potatoes may be raised from the excrescence that grows on the stem more easily than from the apples, and with more certainty of getting the same species." *Stirlingshire Report*.

* This should be done in four bout ridges (the size of a drill), which will keep the ground drier, and expose a greater surface to the frost and air, than when the ground is laid down in broad and flat ridges.

† The potatoes when set above the dung are thought to be drier and sweeter, but not so large or luxuriant.

the potatoes where the furrows were before. In about three weeks after this, the ground is harrowed across the drills, and after the plants are come up, the earth is taken from them with the plough; soon after it is put to them; and after this they are twice hoed, earthing up the soil about the plants as much as may be, and going over it with the hand-hoe, to help any deficiency after the plough, and to destroy weeds.

Some lay on the dung before the first, and some before the second ploughing. In this way it is more intimately mixed with the ground, and will be of more service to the succeeding crop, than when laid in one place in the bottom of the drill, where much of its substance must sink down beyond the reach of the plough. When the dung is mixed with the earth, the potatoes are drier; but they grow larger when all the dung is close to them. The addition to the quantity will not, however, compensate for the defect in the quality.

What we call our infield ground is in general well adapted for potatoes; light, dry, and well pulverized, by being in constant tillage. But some of the outfield grounds are more stiff, and when planted with potatoes would need a cross-ploughing between the two which are given to that crop at present. A little lime, if given at that time to such grounds, would also be of service, but not to ground that is poor and friable.

In any part of a field that inclines to be wet, it is better to dibble in the potatoes into about half the depth of the drill, than to lay them in the bottom, where they will be apt to perish. Perhaps they are in general buried too deep at present, which makes them long of coming up, and later of ripening, than such as are planted at the same time in lazy beds.

In raising potatoes in lazy beds it is not unusual to make the beds too wide, and the furrows too narrow; by which

means a great deal of cold till or gravel must often be raised to give them the second covering. It would be better to make the bed narrower, and the furrow wider, than thus to raise unproductive earth, and endanger the burying of good earth again in place of it.

As the easiest way of bringing in waste grounds is by planting them with potatoes, the poor should be encouraged and assisted in carrying on this improvement, as far as they can do it with safety and to advantage. Cottagers might often plant more potatoes towards the end of May than they have dung for, as ferns, nettles, and other weeds, might be got in abundance to cover them immediately before they get the second stratum; and this would prove a sufficient manuring*.

The rich as well as the poor, the farmer as well as the cottager, should raise as much as they can of this valuable root, as it is not only a profitable crop itself, but puts the ground in the best order for yielding other crops. Potatoes, when they can be spared, make excellent food for cows and horses, and help to keep them cool and healthy when feeding on dry straw. They are also good, when boiled, for fattening hogs and poultry. In Kintyre the working horses are generally fed one end of the day with potatoes. From 15 to 18 lb. or about a third of a Kintyre peck, makes a good and cheap meal for a horse. Near the same quantity, morning and evening, with a very little straw, will sufficiently maintain a milk cow. From the greater solidity of potatoes, per-

* The following method of manuring potatoes in mossy ground is mentioned in the Statistical Account of Symington, and deserves to be known. "Before winter the beds are covered with 6 or 8 inches of moss out of the furrows. After being thus exposed to the winter frosts, in March or April, the surface, when tolerably dry, is burned, the ashes spread for manure, and potatoes afterwards dibbled in; after which they get a second covering out of the furrow, as usual, when they are springing out of the ground."

haps an acre of it will go as far in feeding cattle as an acre of turnips, or of any other green food; but it takes more trouble to dig and house it.

Some in this county were, above 20 years ago, in the use of extracting a spirit from potatoes *. The quantity which it yielded was considerable; but happily the quality was so bad as to discourage the continuance of so ruinous a practice. The quality, however, was much improved by keeping it till it was of proper age.

Beans delight in deep moist soil, and grow best in a wet season. They are not yet cultivated much in any part of this county except Kintyre. They are commonly sown after the middle of March, generally on poor oat stubble, and ploughed down; but sometimes the ground is first ploughed, and the beans harrowed in afterwards. Unless the ground be too wet, the first method answers best, as beans require to be sown deeper than any other grain. They make a good intermediate crop between oats and bear, especially in stiff clay grounds that would not suit some other green crops. But instead of sowing them broadcast, they ought to be sown in drills. This method, in poor soil, such as they generally get, would give a better crop, destroy the weeds, pulverize the soil, and put it in better condition for the succeeding crop. Beans, when sown broadcast, rather encourage than destroy weeds; when the crop is not rank enough to smother them, which is seldom the case.

When sown in drills, the land is the better of two plough-

* The process is very simple. The potatoes are boiled to a thin pulp, which is diluted with hot water, and strained. The mass is then mixed with a little malt (which is perhaps not necessary), in order to make it ferment the better with harm; and when the fermentation ceases, it is distilled in the usual way. According to experiments made elsewhere, it is said that 70 lb. weight of potatoes will yield five quarts of highly rectified spirits.

ings; one at the end of harvest, the other at the time of sowing. The seed may be thrown into every third furrow, which will be a proper distance for the drills.

Pease are frequently sown, but in no great quantity. A dry soil and season agree best with them. Some sow them along with the beans, which in poor soil gives a better chance of covering the ground, and checking the growth of weeds. They are also more easily dried by being mixed with the beans. In this way too one or other of the crops will suit the season, whether wet or dry. When pease are sown by themselves, it would be a good improvement, in poor run-out soil, to plough them down when in full bloom. The small gray pea, which we commonly sow, answers best for this purpose.

Rye is sown on some light sandy soils on the shores of Kintyre, but in no other part of the county. It is well adapted to such soils; and, if it got more justice, might be no unprofitable crop. It is not, however, in much estimation; and the quantity sown at present is so inconsiderable as hardly to merit any notice.

Flax (or *lint*) is raised in all parts of the county, but chiefly for family use; only about 3000*l.* worth of yarn being exported from the continent, chiefly from Kintyre. It is sown about the end of April, or beginning of May, generally after potatoes, or on other land that is clean and in good condition, at the rate of about ten or eleven pecks to the acre. Three stones from the peck is reckoned an ordinary crop; four a good one; some get five; and the value from 10*s.* to 12*s.* the stone. There is one mill for dressing lint in Kintyre, and another in Lorn; but in Kintyre, the farmers generally dress their lint at home, after the harvest is conclu-

ded. This may be owing much to the high charge made for dressing it in the mill, being 2s. 6d. the stone, and *drams*, or about 1-4th of the value of the lint. Proprietors of land are much interested in correcting every thing which discourages the farmer from raising more of this valuable crop. Had we more mills, the charge might be reduced by a competition. Were it, as in other places *, so low as 1s. 6d. the stone, it would encourage the farmer to raise a greater quantity.

Few things would contribute more to the advantage of this county than the raising a great quantity of flax, for which our soil and climate are well adapted. Our climate is warm and moist; and we have a great deal of good sandy loam, which is the best ground for flax. If the culture of this plant were extended as far as the other operations of the farmer would allow; or if the ground, when tilled, were let to the poor, or to persons who, as in Holland, would make it their sole business to attend to it; it would prove an immense benefit to the county, and furnish employment to the poor, especially to the female part of them, in every stage of its manufacture †. When the crop is tolerably good, the produce of a single acre may be estimated at 15l. on the field, at 20l. when it comes from the mill, at 60l. when spun into yarn, and at more than 100l. when wrought into cloth, and bleached. Thus 1000 acres (which would be but 40 to every parish on the continent) would yield materials for a yearly produce of 100,000l.

The attention of the farmer, and the industry of the poor, should therefore be directed, as much as possible, to a matter of so great and general importance. When this shall be the

* Agricultural Report of Angus and Forfar says, it is prepared in the mill for the heckle, at from 1s. 4d. to 1s. 6d. the stone.

† In the higher parts of Perthshire, adjoining to this county, the ordinary farmers commonly pay all their rent by the sales of linen yarn.

case, the minds of some of our land-owners, who now depopulate their estates, will be more enlightened; and they will perceive that the riches or productiveness of their estates must depend more on the number of the people, than of the sheep, by which they are occupied. It is certain, that neither pasturing, nor agriculture alone, can make any country so rich and prosperous by themselves, as when they are conjoined with manufacture and with commerce. But these cannot be carried on in any place which does not abound with people.

As the culture of flax is not yet well understood by the greatest number of those who raise it in this country, it may be proper to give a few directions on the subject. Care must be taken to have good seed, plump, fresh, and of a bright shining colour. The brighter in colour, and the heavier, the better. That which, when bruised, appears of a light or yellowish green, and fresh in the heart, oily, and not dry, and smells and tastes well, and not musty, may be depended on. That from Riga is reckoned the best. Dutch seed is also reckoned good. But if the seed come from America, it should be from the provinces to the north of Philadelphia. Choice must then be made of suitable ground for it. A deep sandy loam, in good heart, clean, and well pulverized, is the best. It answers well on rich ley ground, as it will be free of weeds; or after a good crop of turnips, potatoes, or other cleansing crop.

The seed should be sown when the ground is neither too wet nor too dry, and harrowed in, like clover, with a short-toothed harrow, after the ground has been first broke and smoothed by another harrow. This will prevent any of the seed from going too deep, and make it come up equally. It is better to sow rather thick than thin; for, if too thin, it will branch; and the goodness of the crop will depend on its running into long fine stalks, without branches.

The ground, after sowing, should be well clodded, and then rolled, to prevent its being hurt by drought. When three or four inches long, the crop must be carefully weeded, and as little injury as possible done to it by the feet, or otherwise. The crop should not be allowed to ripen so much as is commonly done at present*. It should be pulled when the stalk begins to turn yellow, as soon as it has lost the blossoms, and before any of the bolls are hardened, and approaching to ripeness. To allow the seed to ripen, would hurt both the crop and the ground. It is owing to the common error in this case, that flax has got the name of being a scourging crop. It is so, when allowed to ripen its seed; but the reverse, when pulled, as soon as it has lost the bloom; as it ought to be when the seed is not to be saved. If the flax is fallen, it ought to be pulled the sooner, that it may not rot. The beets should be no larger than a man can grasp in both hands, and tied very slack with a few dried rushes.

No circumstance respecting the management of flax requires more attention than to water it properly. We generally keep it too long in the pond, or rather in the stream, which is injudiciously allowed to run over it. Instead of this, a canal seven or eight feet wide, and two and one half deep, and of a length proportioned to the quantity, should be made and filled with soft water, three weeks before it is needed, in order to warm it by the sun; supplying, if necessary, any waste occasioned by evaporation.

The beets should be laid in the canal slope-ways, with the root-end uppermost, as the crop-end is apt to breed vermin hurtful to the flax. It may be covered with divots,

* The finer quality of Irish and foreign lint is ascribed to its being pulled before it is ripe. This, too, will add to the quantity. A writer in the Statistical Account (XVI. 527.), after telling that 7 1-half stones were got from three lippies of seed, observes, that *it was pulled before it was fully ripened.*

the green side undermost, and, if not heavy enough to keep the lint under water, some stones may be laid above them, but the flax should not be pressed to the bottom. If the flax was pulled in proper time, and that the water is warm and soft, the rind will probably be sufficiently loosened in seven or eight days; and if, on trial, it is found to be so, it ought immediately to be taken out. It is always safer to give it too little, than too much watering; as the defect may be easily remedied by giving it the longer time upon the ground; whereas a mistake on the other hand cannot be repaired. When sufficiently watered, it feels soft to the gripe, and the *harle* parts easily with the *boon* or *bow*, which last is then become brittle, and looks whitish. The coarser the flax, the sooner it is watered. Each beet, when taken up, should be gently rinsed in the pond, to clean it of any mud or nastiness.

If the flax is spread on poor ley, it will improve it greatly; and the water in which it has been steeped is also a valuable manure, which should be carefully carried or conducted to some ground that needs it; or weeds and straw &c. thrown in to absorb it and make dung. The flax should be spread thin and equally, and handled tenderly. If it meet with a few hours of dry weather after spreading, it will be so much the better, as it will make the *harle* firm to bear the rain.

The flax, after lying on the field till it is sufficiently blistered in the boon, and easily parts with it, should be taken up in a dry state; and, to give it the greater crispness, may have a little heating on a kiln, immediately before it is wrought; using for this purpose some charred coals, or any fuel that has little or no smoke.

If at any time the flax shall be allowed to ripen so far as to harden its bolls (as at present), which it ought not, they should be ripped off before it is put in the water; as they make a

rich and excellent food for cattle, mixed with boiled chaff, and should be carefully dried and preserved for that purpose.

Estimate of the Expence and Profit of 1-4th Acre under Flax.

Rent of ground prepared, usually the price of the		
feed,	- - - -	L. 0 13 9
Two pecks and three-fourths seed, at 5s. per peck,		0 13 9
Clodding and sowing,	- - - -	0 1 0
Weeding,	- - - -	0 3 0
Pulling and watering,	- - - -	0 4 6
Spreading and lifting,	- - - -	0 3 0
Breaking and skutching, at 2s. per stone,	-	0 16 0
		L. 2 15 0
Produce of a middling crop 8 stone of 24 lb. at 12s.		4 16 0
Profit,		L. 2 1 0
Or (per acre),		8 4 0

For Cambric and Fine Lawn

The ground should be a rich, light, and dry soil, sufficiently pulverized by repeated ploughings when in a dry state, or after potatoes; and, if near a wood, it will save trouble. The seed should be sown before the middle of April, about double the quantity usually sown for flax or lint. The ground should be rolled, if dry, and weeded when it is three inches long; after which, forked sticks (about one 1-half inch thick) should be set at four or five feet distance, poles laid along these forks, about six or seven inches above the lint, and distant from each other two, three, or four feet, according to the length of the brushwood that is to be laid over them. This brushwood ought to be laid close and even, rising all about eighteen or twenty inches.

The lint should be pulled as soon as the seed is formed,

or a few days after it is out of the bloom, before the lint turn yellow. If any be coarser than the rest, it should be kept separate. It must be pulled above the brushwood, and every handful laid upon it four or five hours to dry, if it is fine weather. Spread it out four or five days, putting it into a barn at night, and taking care that it get no rain, which would make it turn black. If it get wet, it is better to leave it on the grass till dry than to put it in wet. The bundles must be opened in the barn, or made very loose, to keep them from heating.

The pit for watering should be made long before it is used, and will be the better if it has a clean sward on the bottom; if not, some straw may be put under it. A small rill of clean water should run in and off the lint while in it. The pit may be six or seven feet broad, by three deep. Along the surface of the water, or a little lower on the two sides, run poles fixed down by wooden hooks of this figure, 7; and other poles across, with their ends under these, to keep all the lint down three or four inches under the surface of the water. The time of watering depends so much on the weather, and on the softness or hardness of the water, that no certain period can be fixed,

It may be proper to observe here that the introduction of the two-handed wheel, hardly known as yet in any part of this county, would contribute perhaps more than any thing to the speedy increase of our flax crops. This simple machine, now common in other parts of Scotland, would enable the same number of hands to spin the double of what they do at present; so that there would be a call for raising a double quantity, one half of which would fall to be added to our present exportation, and bring a large yearly revenue to the county, besides enabling the poor to earn twice as much by spinning as they do at present. A small premium to the

first, second, and third, who should use these wheels in any parish might have a good effect. After that we may perhaps, as in other places, go a step farther, and think of spinning lint in a still greater quantity by the use of water-machinery, which is now made to spin flax as well as wool and cotton.

Time of Sowing.

Beans and pease are sown after the middle of March; oats from the 20th or 25th of March to the middle of April; flax and potatoes in the end of April and beginning of May; bear from the 1st to the 15th of May; clover and ryegrass sometimes with the bear, and sometimes 8 or 10 days later; turnips in June.

Harvesting.

Hay * is cut about the beginning or middle of July; flax is pulled about the beginning or middle of August; bear begins to be cut down about the 15th of August; oats about the 15th of September; beans and pease are cut after the oats, about the beginning or towards the middle of October; and the potatoes are housed commonly about the first week of November.

Produce.

The average produce is reckoned to be nearly 3 returns from oats, 5 1-half from beans and bear, and about from 10 to 12 from potatoes. Further particulars may be found under the different crops, and need not be repeated †.

SECT. V.—*Crops not commonly cultivated.*

WHEAT has been frequently tried, and found to answer

* *i. e.* From sown grasses. Meadow hay is seldom cut before August, as it is late of being saved.

† The quantity of arable land on the continent of Argyleshire was suppo-

well, particularly in deep loam and strong lands in the neighbourhood of Campbelton. The reasons alleged for not cultivating it commonly are, the want of enclosures, and the want of a flour mill. But these reasons will hardly be sustained, as there are in that part of the country a considerable number of enclosures; and some good spring-wheat has been raised on fields entirely open; and if the grain should be raised to a sufficient quantity, it would always find a mill. A little addition to the machinery of the present mill would serve. The true reason is, that the demand for bear to make whisky is greater than even that for bread to eat; and the distillers have a brisker trade and more ready cash than the bakers.

The neglect of this crop is a considerable loss to the farmer, as, in suitable soil, and within reach of good manure, it is of all corn crops the most profitable. It is also a great loss to the county in general, as more than 3000*l.* is yearly sent out of it for flour, which might all be saved, if we would raise wheat of our own.

What would favour much the cultivation of this grain in Kintyre is, that there is seldom any frost that would hurt it; so that the climate, as well as the soil, encourages the growth of it.—John Turner, a farmer in the neighbourhood of Campbelton, says that the crop of between eight and nine acres brought him one year above 100*l.*; and the crop of four acres another year brought him 50*l.*

fed (Chap. I. Sect. 2.) to be 100,000 acres. Of these it is supposed there may be

15,000	lying waste in sheep farms,
20,000	ley,
40,000	under oats,
12,000	under potatoes,
9,000	under be ,
3,000	under clover, flax, beans, and pease,
1,000	under gardens.

100,000 +

Kintyre wheat has been sometimes sold in Ayr and in Glasgow, where it fetched the highest price in the market.

Wheat may be sown after a fallow, after clover, or with no trouble after a potato crop, as soon as it is taken up in October. Besides the profit of introducing this crop, as yielding a better return than oats or barley, it will be attended with great advantage in point of convenience, as the labour of the farmer will be more divided, by having crops that are sown and reaped at different seasons, which will give him more leisure to attend to each of them. A variety of crops, regularly succeeding each other, so as to furnish work at every season, without being at any time too much hurried, is a matter which the farmer ought carefully to study, so as to make always the most of time, hands, and horses. A blank in this economy with us at present might easily be filled up by a crop of wheat. It is much to be wished it may be so.

Turnip is a crop to which the soil and climate of this country are well adapted, but which, though cultivated occasionally by some proprietors 20 or 30 years ago, is not yet commonly cultivated by the farmers. Within these few years, however, a number of the farmers in Kintyre, particularly on Lord Stonefield's estate, have made trial of turnips; and the advantage has been found so great, that there is reason to hope that the culture of them will soon become general*. —In a country in which the cattle live in winter on dry straw, it is surprising that this valuable winter food has been so long neglected, especially where there are any enclosures to preserve it.

* The greatest quantity raised yet by any farmer in this county, was by W. Kerr, near Campbelton; who had last year four acres under this crop; for which he obtained a premium from the Highland Society.

Besides their value for winter-feeding, turnips answer the same purpose as a fallow, by cleaning and pulverizing the soil, so as to put it in the best condition for giving an excellent crop of bear; which ought to recommend it to our farmers, whose great object is to raise as much of that grain as possible.

Turnips thrive best in light, dry, sandy, or gravelly soil, such as we have in abundance. The land is prepared for them in the same manner as for potatoes. It is ploughed first before winter, next in March, and lastly before the seed is sown, with harrowings in the intervals. After the dung is covered (if it was not put on before the last ploughing), and the drill formed, the seed is sown on the top of the drill, over the dung, and slightly covered, by sweeping the earth over it from either side with a bush or broom. Till proper sowing-machines are introduced, the seed may be sown from a white-iron box, with two or three small holes in the lid; or it may be dropt through the pipe of a tea-pot, or through a quill fixed in the cork of a bottle. About two pounds should serve an acre: but as it is liable to be attacked by the fly and slug* for a few days after it gets the leaf, it is best to sow thick, that in case of such an accident there may be enough remaining.

When the plants have got the rough leaf, or at farthest when they are an inch or two long, they are thinned with a five or six inch hoe, leaving two or three plants together till they are a little stronger, when the weakest are picked out by the hand, and the best plant left, 8 or 10 inches distant, or even 12, if the soil be very rich. They are afterwards hoed

* As the fly which destroys turnip has not yet been known to do any mischief to field turnips in this county, some think that there is something so inimical to it in the soil or climate as to secure us from any harm from it. The slug, or snail, is more complained of.

and weeded repeatedly, as potatoes; only that the turnip, or bulb, should not be covered. They may be sown about the middle of June; and may produce, if the crop is good, from 25 to 30 tons per acre. The provender and manure from such a mass must be of great consequence to the farmer. Those crops which, besides food, create manure, are highly deserving of his attention. If turnips get manure, they restore it with interest.

Ruta-baga, or *Swedish turnip*, has hitherto been cultivated with us only in gardens; but it merits much the attention of the farmer. It is an excellent spring food, calculated to fill up the gap between the time in which turnips begin to shoot and lose their nutritive quality, and the coming in of the grass; for it is later of shooting than the turnip, and, after it is shot, retains most of its nutritive juices and solidity. The root is not so large as that of the field turnip in general; but it is so much heavier in proportion to its size, and so much firmer in its texture, that it is believed an acre of it may contain as much nourishment, and nearly as much weight as one of turnip. Its specific gravity, compared with that of common turnip, is nearly as five to four. Frost does not hurt it; nor does it rot when part is broken, or scooped out in the ground. Horses too, it is said, will eat it, though they will seldom offer to touch turnip*. The culture of it

* Carrots, however, are reckoned the best root for horses; and are raised for feeding them, in many parts of England, to more advantage than corn. They thrive best in good friable loam, or sandy soil. They are sown in April, in drills a foot asunder, and hand-hoed. In the Bath Papers, the produce is estimated at ten tons per acre. Others make it much more. At Parlington, in Yorkshire, twenty work horses, four bullocks, and six milk cows, were fed on the carrots of three acres, from the end of September to the 1st of May,—and thirty hogs fattened on the refuse. They had no other food but a little hay. *Encyclop. Brit.*, I. 391.

is the same with that of the field turnip, only that it should be sown about a month earlier*.

Cabbages have been raised for winter food by two or three proprietors, but none as yet by any farmer. They make a proper green crop for stiff clay lands, which are not adapted to the cultivation of potatoes or turnips; and on such a soil they never fail to succeed.

Cabbage is a very important article of winter food. It is easily raised, subject to few diseases, resists frost more than turnip, and may be used when turnip is locked up in frost, or covered with snow. It is also palatable to cattle, and soon fills them.

The ground is prepared for it in the same manner as for potatoes or turnip, and the plants set in the drills from 24 to 30 inches distant. An acre will take from 7000 to 8000 plants. The produce will depend much on the soil, manure, and cultivation. In *Young's Six Weeks Tour* the average produce is stated at 36 tons per acre.

The plants may be raised by the farmer himself in his garden. A pound of seed will, if it thrives well, furnish plants for an acre. Care must be taken to preserve the plants from birds when springing out of the ground. They must be transplanted, when fit for it, into beds; which will make them lose the tap-root, and shoot out a number of lateral fibres, fit for finding nourishment. It is necessary they shall undergo this change before they are planted in the drill, as it is also before they are planted in gardens.

The time of setting the plants depends on the time in which they are to be used. If for winter, plants from seed sown in the end of July, the preceding year, must be set in the end of March or beginning of April; but if intended for

* See *Stat. Acc.* XV. 179. and IX. 289.

feeding in March, April, or May, the plants must be set in the end of June or beginning of July, from seed sown in the beginning of March the same year. This crop makes an important link in the chain that connects winter and summer green food. The more usual and surer way, however, is to set in March, when the ground is between wet and dry; a circumstance that should always be attended to in stirring clay soils.

If a line is stretched at right angles across the drills, and the plants regularly set in that manner, it will give an opportunity of ploughing, or horse-hoeing, not only along the drills, but also across them; which will be of great service to the plants, and of still greater service to the ground. No crop meliorates the ground more than cabbage. It derives most of its nourishment from the air, and manures the ground with its leaves. When it is cut, any leaves that are discoloured should be given to young cattle rather than to milk cows, as they might give a bad flavour to the milk. If the milk or butter should be found to have any such flavour when cows feed on this plant or on turnips, it may be taken away by mixing a little boiling water with the milk when taken from the cow, and mixing a little salt with the cream when it is skimmed off: or a little nitre, dissolved in water, will have the same effect.

Green Kail, though yet confined to large gardens, except in very few instances, is much used in Kintyre, both as summer and winter food for cattle. When planted early, it gives three or four large croppings before the end of August; after which it is allowed to grow till winter, when, and till the end of spring, it proves a valuable article of green food, in a country which as yet has hardly any other. For this crop sea-ware is found to be the best manure; and it answers equally well for cabbage.

Barley is a grain scarcely known in this county. It ought certainly to be cultivated to the extent which the consumpt of the county requires, by which at least 1500l. a-year, which is now sent away for pot-barley, would be kept at home. It appears from the trials which have been made, that it would grow well with us, and the farmer who should raise it, would have at least the freight and carriage as an advantage over the farmer who raises it in the low country, from which it is now imported. It requires the same soil and culture with bear. And although the produce of it may not be quite so much in bulk as that of bigg or bear (as it has only two rows, instead of four, which the bigg has), yet as the grain is closer in the row, and so much plumper and larger, that it weighs four pounds more in the bushel, and draws four or five shillings more per quarter, it is supposed to be on the whole more advantageous than bear. It is not quite so hardy, nor so quick in vegetation as bear; but in a cold or backward seed-time, steeping it in rich dung-hill water twenty-four hours, and spreading it on a floor, with a mat over it, for a day or two, till it tends to vegetate, would make up for a fortnight's delay in the sowing. In respect to bear too, this would be more advisable than to sow it when the season in which it should be done is too cold, or the soil too wet for its reception. Last year a farmer in Kintyre, finding that a great part of the bear he had sown in a field had misgiven, steeped for a day or two in the sea a quantity equal to supply the defect, which he then rolled in, in warm moist weather; and in a short time the difference between it and the first sowing was not perceptible. As the grain swells to a third or fourth more bulk by steeping, a proportionable allowance must be given in the quantity of seed.

Hemp ought to be cultivated in this county, especially in

the neighbourhood of Campbelton, which alone sends away above 3000l. a-year for ropes and sail-cloth. The manufacture of these articles is simple, and the first step towards it would be the raising of hemp. It is surprising, that in a maritime and fishing country, the culture of it should have been so long neglected. The manufacture of hemp into nets and cloth, would be a fund of employment to the families of sailors, and other poor, now almost idle.

Hemp is capable of being wrought not only into these coarser articles, but also into fine linen; more lasting than that made of flax. Hemp requires rich and strong soil*, but it exhausts the ground so little, that for many years it may be raised on the same spot, if well manured. It is an excellent cleaner of the ground, and is said to have the property of preserving from insects any crop that is within a belt of it: It is sown about the same time with flax; from twelve to sixteen pecks to the acre, according to the quality of the soil. If sown in drills, much less will do. It is later than flax in ripening, and grows in male and female plants; of which the former produces only flowers, and the latter seeds. The male kind ripens four or five weeks before the female. The female is ripe when the flowers fade, and the stalk turns yellow; and the male, when the stems become pale. Both are less injured by being pulled too soon than too late. When the one is pulled, care must be taken that as little injury as possible may be done to the other. If the ground is formed into drills or narrow ridges, there will be no danger of hurting it.

After the hemp is pulled, and the leaves, seeds, and branches taken off with a ripple, it is made into bundles of twelve handfuls each, and steeped as flax, from six to eight days. It is

* In Staffordshire, however, large crops of it have been sometimes raised upon a deep black peat well drained. *Agr. Rep.* p. 83.

known to have enough of the water, by the reed separating easily from the bark. It is better the time should be too long than too short. The slenderest requires the longest time. When the quantity is small, the bark may be separated from the reed, by pulling out the reed from every stalk by the hand; when large, by drying and breaking it like flax. It is not spread on the ground like flax; but dried immediately, by setting it leaning against ropes tied to trees or poles; or any other way that will give it all the advantage of the air, till it is thoroughly dry, and blistered from the boon. After it is reeded, it must be freed from the mucilaginous matter, by pouring water on it, and squeezing it several times, taking care not to let the threads entangle in each other. It is prepared for the heckle, first by coarser, and then finer breaks.

As the produce of an acre of hemp, when it grows well, may be reckoned about forty stone, and the price from 10 to 12s. it will prove a profitable crop to the farmer, who has greatly the advantage over the importer of foreign hemp, which, over and above freight and risk, is liable to a heavy duty*. But the principal advantage of this crop is, that, like flax, it is capable of being wrought to many times the value of the original raw materials. It is spun into clues of 4800 yards, and pays about the twentieth part for bleaching. The price of the clue depends upon its fineness. At one clue from the pound, it is 7d.; one 1-half, 8d.; two, 9d.; two 1-half, 10d.; and three clues, 12d. each. A spinner will earn 6d. a-day with ease, spinning two-thirds of a clue; and a weaver may earn from 10s. to 15s. a-week. The finer yarn is made into cloth for shirts and sheets, worth from 3s. to 4s. the yard; and lasts twice as long as that which is made of flax.

* The duty on imported hemp, when dressed, is 2l. 4s. per cwt.; undressed 3s. 8d.

To encourage the growth of hemp, where there is so much need of sail-cloth, cordage, and netting; to keep the money that goes for these articles in the country; and to give employment to the poor, it might be of use to have a few considerable premiums proposed by the trustees, or other public-spirited societies, till the manufacture of it is once established. The making of sail-cloth and cordage is the most natural manufacture for Campbelton, which abounds in hands, and sends away large sums for these articles that might be so easily made at home.

Madder. From the premiums which are proposed by the patriotic Highland Society for the cultivation of madder in the Highlands, it is probable the culture of it may be soon attended to, and therefore it may be proper to give a short account of it.

Madder, or rather a substitute of much greater value, called by the same name, is a native plant of Britain, lately come into great estimation, since the art of dyeing cotton a Turkey red has been discovered. The root gives a colour nearly as bright as cochineal, and the top answers all the purposes of weld in dyeing yellow. It delights in a deep dry soil well pulverized*, of which an acre may produce from three to four tons; and one ounce of seed will produce plants enough for an acre.

The seed is sown in beds in April, and in two months the plants are set out into drills eighteen or twenty inches asunder, and duly hoed. In about four years, with only the trouble of occasional hoeings, they will arrive at a proper maturity. They are taken up in such quantities at a time as can readily be cleaned of the earth and outer rind, which is done by washing them in running water, and then wiping

* Mossy land, well drained and reduced, would probably answer as well.

them dry. After this they are dried by the sun; or, when that is not powerful enough, in a stove, so far as to stop fermentation, without injuring or scorching the remaining and finer bark. When thus cured, they are immediately (before they imbibe any moisture from the air) grinded in a mill, or otherwise, and casked up for use. The longer they are in the cask before they are used, the better. Madder sells at sixpence the pound, or 5*l.* per ton; and cochineal at thirty times as much: yet one pound of madder dyes two pounds of cloth, and a pound of cochineal but sixteen pounds of the same cloth, equally deep, but less fixed and lasting*.

* See *Agricultural Report of Surrey*.

CHAPTER VIII.

GRASS.

SECT. I.—*Natural Meadows and Pastures.*

THIS county abounds in good pasture, which has been much improved of late by pasturing sheep upon the hills, and burning the old heath. There is yet room in many parts of it for the extension of this improvement. But there may be some danger of its being overdone; for if the heath should be destroyed altogether, the sheep and other cattle might feel the want severely in times of heavy snow, and indeed through most of winter. It seems to be a kind provision of nature for animals lying out in that inhospitable season. "The young shoots of heath the year after it is burnt is the great food of sheep. If it is burnt in winter it dies *." Great judgment is therefore necessary to be used in burning heath. The nature of the soil should be considered; its situation with regard to shelter; and the proper season of burning (spring or winter), as it is or is not intended that it should grow again. The ground that is burned should be carefully herded for some time, to preserve the tender grass from being plucked out of the roots by the sheep, which would hurt the pasture for many years.

This county contains also a great extent of meadow; but the quantity of natural or bog hay which it yields is seldom

* *Statistical Account of Linton*, Vol. I. p. 133. In Strathdon they uncover the heath with spades, to let the sheep get at it, in deep snow; and even cut off the tops of heath when in flower, and dry and preserve them for winter store. *Stat. Acc.* Vol. XV. p. 463.

large, or of a good quality. A great part of it falls short of 50 stone per acre. Much of it is neither drained, nor enclosed, nor sowed till it is far advanced in the season; and it seldom receives any manure but what chance bestows upon it. Some of the meadows are not cut till late in the harvest, when the crop is so much withered as to be more fit for litter than for food, if provender were not so scarce as to make it still precious. If these lands were enclosed, drained, and watered, or otherwise manured, many of them might be made to produce five or six times as much per acre as they do at present. Cold and wet soils, such as are many of these meadows, are better adapted for raising grass than corn, and the greatest improvement of which they are capable is thus to mend the quality and to increase the quantity of their produce, when they have a whole and even surface *. When they have not, they should be turned up and dressed, and laid down with artificial grasses.

SECT. II.—*Artificial Grasses.*

CLOVER and ryegrass are raised in all parts of the county, but in no great quantities; though our soil and climate are well adapted to the raising of these and other green crops. Farmers as yet deal but little in grass seeds. What is sown of them is mostly by proprietors and gentlemen, who have enclosures. Without these indeed the improvement cannot be carried on to such advantage; yet, on dry grounds, with tolerable attention in winter, the benefit would still be great.

These grass seeds are generally sown with bear (seldom with oats or flax seed) on ground previously occupied by potatoes. The quantity of seed is commonly sixteen pounds

* Meadows which have a smooth, but soft and marshy surface, would be long of recovering a sward, and should therefore be dried and improved as much as may be, by a few deep ditches, without turning them up.

red clover, and two bushels of ryegrass to the acre; and the produce, on suitable soil and in good heart, about two hundred stone of hay. The grass seeds are sown after the bear is harrowed, and sometimes eight or ten days later, covered lightly with a short-teethed harrow, and the ground then rolled, by such as have a roller. The crop is, or should be, cut when the clover is in flower, and the ryegrass in its purple bloom, which is commonly about the last week of June or first of July. A second crop might be got of the clover the same year; but it would exhaust the ground and be difficult to win; so that it is always better to cut it for green food, or to pasture it. If pastured with cows, care should be taken to put them in when it is dry, and only for a very short time at once, for a few days; otherwise it may be fatal to them.

As the raising of cattle is the principal object in a great part of this county, no improvement is more necessary than the general cultivation of artificial grasses, and green food, for their support in winter. The farmer would also derive a prodigious advantage from laying down his fields with grass seeds, and in good heart, when they are given up to rest. Such addition to his summer pasture would enable him to keep more cattle, and to sell them fat at Martinmas, instead of selling them lean at Whitfunday. The difference would be at least 40s. a head; and this might be obtained from an acre, which by the present management does not yield a fifth of it. Besides, this improvement will add to his manure, and consequently to his grain.

The kinds, quantities, and proportion of grass seeds that should be sown, must depend on the soil, and on the time for which it is intended it should remain in grass. If the soil is a dry sandy loam, red clover will suit it particularly well; but it is not so fit for land that is wet. If it is intended to take one year's cropping, and to be cut green,

this grafs answers the best of any; and twenty-four pounds of it should be sown on a Scotch acre *. For cutting green it cannot be too thick. When too thin it is coarse and reedy. If the crop is intended for hay, sixteen pounds of it, with two bushels of ryegrass, will answer better; as by itself, it is difficult to dry. If it is intended to be pastured for two or three years afterwards, a half, or at least a third of the clover seed should be of the white kind, with a pound or two of rib-grass. Red clover is a biennial; but the second year's growth is seldom worth the sowing for hay.

On some of our poor light grounds, called outfield, a crop of hay is not to be expected. They should therefore be sown with a view to pasture, with six pounds red, twelve pounds white, and two pounds yellow clover, two pounds ribgrass, and one bushel ryegrass, per acre. White clover grows naturally on most of our dry lands, especially when limed; a plain intimation that if sown it will thrive, as it is so congenial to the soil.

For wet mossy grounds the properest grafs of any seems to be the soft meadow, or creeping grafs. This is one of the most valuable of meadow grasses, its pile being exceedingly close, soft, and succulent. It delights in moisture, and spreads so fast, by its running roots, that however thin it is sown, it will soon be thick. In this county, which abounds in mossy lands, no grafs deserves to be more cultivated than this soft meadow grafs (*bolcus lanatus*), though it be hardly known as yet in the greater part of this district. It is certainly a good grafs for sheep, but is by some esteemed bad for cattle and horses †.

* The seed should be plump, and of a purple colour, as that is the colour which it takes when ripe. It is faint, when not ripe; and red, when hurt in drying.

† The writer, however, has found it to agree well both with his cows and horses.

Timothy-grass is also well adapted for boggy lands, as it grows best in a wet soil. Its roots are so strong, and so interwoven with one another, that they render even soft land fit to bear the tread of cattle. This property adds much to its value, and all cattle, it is said, are fond of it.

When any ground is so soft as not to admit of being dressed in time to be sown with grain, it may be sown with grass seeds alone, though so late as the end of summer or beginning of harvest. As such ground is not well adapted for grain, which might also hurt the grass by lodging, and at any rate by depriving it of nourishment, many think this to be the best method; as, in this case, grass, and not corn, should be the principal object. Upon some of our poor thin soil also, perhaps it would be better to sow grass seeds alone, when the principal view is to convert them into pasture. This method is often practised upon such soils by some of the English farmers*.

For light dry soil, intended to be kept long under grass, sain-foin has been much recommended by some, and preferred to any other. They say it produces a large crop, does not hurt cattle when eaten green, makes better hay than clover, keeps the ground long, and grows on poor land. The great drawback upon it is, that for the two first years it is so thin as to be of little value. But afterwards it keeps the ground, and gives large crops, for fifteen or twenty years; especially if it gets a top-dressing at the end of several

* An Essex farmer writes on this subject as follows: "Mr. H. asks what season of the year is most proper for laying down land to grass, without taking at the same time a crop of corn, upon a thin soil, with a cold clay bottom? Being the occupier of a considerable tract of land, corresponding with this description, it has been my constant practice, when wishing to convert arable into pasture, to make first a good summer fallow, and the following spring, to sow it with ryegrass, Dutch clover, and trefoil; this management has generally provided me with good feed for the succeeding autumn." *Month. Mag.* Oct. 1797.

or eight. It gives two crops a year, but it is best to mow only the first. It should be sown after potatoes, which cleanse, pulverize, and enrich the soil; four bushels to the acre, broadcast; or half that quantity in drills, which is better. The drills from twelve to fifteen inches asunder, and the seed one inch deep. The seed should be of a bright colour, the kernel plump, gray or bluish without, and greenish within, when cut. If thin, furrowed, and of a yellowish cast, it is bad.

Of lucerne, burnet, fescue grasses, and root of scarcity, cole-seed, rape-seed, tares, vetches, &c. it is unnecessary to speak. Those described are sufficient, and seem the best adapted to our soil. We may at least begin with them, before we proceed to the other.

SECT. III.—*Hay Harvest.*

HAY is made in this county by spreading and turning it through the day, and gathering it into small coils at night, and so on till it is made, or rather more than made; for it is a common error to dry it too much. In this way of making hay, it is difficult to preserve the colour, juice, and flavour of it. The following method which is easier and better, has been found to answer well, especially with clover and ryegrass. The hay is cut when dry (though this is not necessary), and immediately shaken into small coils; each about the size of a bee-hive; and then with a sweep of the hand the tails gathered under it, so that it gets the shape of an egg standing on the large end. In this way, if the weather should be wet, the rain will run off; or, if it should go through the coils, they will soon dry, as they are so small. After two days, if the weather has been favourable; or when they are found in condition, every two are made into one, of the same shape, taking care to put the surface of the old

in the bottom and heart of the new. In this state they may be left till they are found to be fit for being made into cocks. Hay has been made in this manner without any trouble, even in broken weather; and so as to retain its colour, scent, and juices, much better than by spreading it in the usual way.

Some preserve their hay in barns, and some in stacks. In either case, it should always be cut with a hay-knife, or hay-spade, and not pulled; as the pulling will deprive it of the greatest part of the heads and feeds, which are the best of the hay.

SECT. IV.—*Feeding.*

PASTURE lands in this county are so very different, that though an acre of some may maintain a cow in summer and harvest, ten, or even twenty, would be too little in other parts of it. Different parts of the same farm are sometimes thus different in their quality.

With regard to our arable lands, in the exhausted state in which they are commonly left to rest after cropping, it will take several acres of them to feed a cow for the first year; and, great as the aptitude of the soil and climate is to produce grass, they hardly gather a tolerable sward before they are again broken up: whereas, if they were laid down in heart with grass seeds for pasture, one acre would frequently be found sufficient to pasture two of our small cows. An acre of the better ground, or *infield*, would for the first year do a great deal more, by cutting it green, and soiling, or house-feeding them. To those who have but little land, this is certainly the way to make the most of such a crop, or at least of a part of it. The advantage too of getting their food with such ease, with only the trouble of going twice a-day to get air and water, would make cows give a double quan-

tity of milk. In Kintyre the farmers have commonly a patch of clover or green kail in their gardens, to feed their cows when they are housed at noon. In most other parts of the county they are folded, and allowed to fast: the consequence is, that a cow in Kintyre gives generally a third more of milk than one in most other parts of the county. Young cattle too, if they got their food, or at least a part of it, with the like ease, would grow faster, and to a greater size*.

It can hardly be conceived how far an acre of good clover will go in feeding cows and horses in the house, when three good crops are got of it. "Mr. Ramsay of Ormsby, near Yarmouth, from the second week of May till the wheat stubbles were ready (seventeen weeks), foiled twenty horses, seven cows, five calves, and five pigs, on seven acres; while a tenant of his fed the same stock, in number in the fields. When Mr. Ramsay had consumed five acres, his tenant had consumed thirty; and his cattle were not in such good condition†:" so that one acre mown went as far as six when fed. The ground is also saved from being poached, the grafs from being dirtied and bruised, and the manure turned to more account.

It is commonly computed that the crop of an English acre of tolerably good clover may be 20,000 lb. green (or 5000 dry), and that a large cow will eat 110 lb. green (or 27 1-half dry) per day. Now, our acre being a fifth larger, and our cows by one half smaller, if we should reckon only on two crops a-year, an acre will thus maintain five cows for six months, at 55 lb. to each per day. Cows kept in this way will thrive

* "An attempt was lately made, with much success, of rearing cattle in the house on green cut clover in summer, and on turnips in winter. The quantity of dung raised by this method of feeding is astonishing; and the cattle attain the same size, and bring the same price, at three years of age, that they formerly did at four." *Stat. Acc.* XIII. 540.

† *Young's Annals of Agriculture.*

much the better if they are kept clean, and curried, like horses; of which they are no less deserving.

The raising of green crops, and applying them (cut green) to the feeding of cattle in the house, cannot be too strongly recommended. On this, more than on any other single circumstance, depends the profit of a well-managed farm.

CHAPTER IX.

OF GARDENS AND ORCHARDS.

IN this county we are in general far behind in gardening, though of such importance to the pleasure, health, and subsistence of the inhabitants. Half an acre of garden ground, well cultivated, would go farther to support a family than four times as much of other ground; and the offals would be of great service to cattle. Thus too the farmer would add to the variety, as well as to the quantity of food for his family, all the year round; and the living partly on cabbage, turnips, carrots, onions, &c. would contribute to health as well as to economy; for a change of food is undoubtedly wholesome.

Indeed the poorest cottager has commonly a small garden; but the contents of it are seldom more than a few greens. Besides these, the farmer has sometimes a few cabbages; but he is commonly more than an ordinary farmer who has a few roots, and some leeks and onions. The progress of this improvement, notwithstanding its utility, is extremely slow, although it lies within the reach of the cottager and tradesman as well as of the farmer.

Proprietors, whose income enables them to keep a gardener, have the common productions of the garden, roots, and small fruit, in great abundance, variety, and perfection. Some of them too have a considerable quantity of fruit, but few have any to spare; for hardly any can be said to have what deserves the name of an orchard.

As the raising of orchards is a profitable business, and an improvement for which this county is peculiarly adapted, the matter deserves much the attention of our landlords. Orchards are generally reckoned to be worth from 5l. to 10l.

2-year per acre, according to soil and situation. Now this produce, except the trifling expence of the trees, is so much clear gain, as the undergrowth or pasture is hardly injured by the trees, if they are planted, as they ought, from 30 to 40 feet distant, or even more.

Orchards too may be planted on ground not capable of cultivation *. Hundreds of acres of such ground may be found with us in every parish. The produce, from the convenience of our situation, might be sent to market with ease, and a large revenue brought yearly into the county. Thus might be kept in the kingdom the money that goes yearly for fruit to America, and the improvement be not only a local but a national advantage.

In recommending this improvement, it may be observed that the common and general exposure of this county is to the south and south-west, the most favourable of any for orchards. The surface of the county too is so uneven as to afford everywhere sheltered spots and hollows fit for this purpose: the soil of such places is also deep and loamy in general, and the climate is warm and moist. To this we may add, that the strong reflection of the sun from hills and rocks makes our valleys warmer in summer than most other parts of Britain.

“ I think I am pretty far advanced towards the south of Great Britain, when at Richmond, in Surrey (says Mr.

* In the parish of Dalziel, the fruit of twenty acres, planted on the slopes of brooks, yields from 100l. to 167l. per annum; and of these twenty acres not six were worth sixpence an acre, except for planting. *Stat. Acc.* III. 460. — This parish is but five miles by three, and produces yearly 400l. worth of fruit. Our parishes in Argyleshire, compared to it, are large provinces, and might produce a revenue of this kind large in proportion. The county of Worcester, which is but 30 by 20 miles, has 2000 acres of ground under orchards; and exports yearly 11,625l. worth of fruit, 30,000l. of cyder, and 5500l. of perry; in all, 47,125l., which is above 20l. per acre. *Agr. Rep.*

“ Leitch, a gardener, who writes on this subject); but I
“ declare I found greater heat in the glens of Argyleshire
“ than ever I could perceive this summer or harvest (1793)
“ in this place. I observed, that when I had my residence
“ in the West Highlands, that the wood-strawberries, bram-
“ bles, &c. were always ripe at an earlier period than ever
“ I had seen them in the low-country. I can assure the nobi-
“ lity, gentry, and the public in general, that there are vast
“ numbers of tracts in the West Highlands of Scotland that
“ would ripen apples and pears better than any in the low-
“ countries of the kingdom. Were I a man of fortune, the
“ place I should raise orchards in would be the shire of Ar-
“ gyle. There, along the winding glens and serpentine turn-
“ ings of the lochs, are immense quantities of fine land, and
“ pleasant concave banks, taking the sun in their arms the
“ whole day, and guarded about on every side by natural
“ woods, so that no storm can annoy them. These High-
“ land glens are the very places adapted by nature for the
“ Scotch to raise orchards in; and I hope the Highland no-
“ bility and gentry will have their eyes soon opened to such
“ a natural advantage, and will pursue it with vigour. The
“ most fruitful shire for apples in all England is Hereford-
“ shire; but Argyleshire possesses advantages superior to it,
“ for this branch of husbandry.”

Mr. Leitch argues from the vigorous growth, shining bark, and healthy state of our forest trees, that fruit trees would thrive equally well; and experience, so far as it goes, fully justifies the opinion. The few old trees which we have, planted in suitable soil and situation, are as healthy and fruitful as any in the kingdom*: and some gentlemen who have

* A pear tree in Kildalloig, near Campbelton, measures nine feet in circumference. Pear trees are propagated by grafting on pear stocks; plum trees, by budding or grafting on plum stocks, raised from the stones; and cher-

within these few years stocked their gardens with fruit-trees, have found them to thrive beyond their expectation. It is but three years since the gardens at Inverneil and Oakfield were planted, and the quantity of fruit in them last year was so great, as to give a reasonable expectation that, in two years hence, they will yield more than the families of the owners can consume: so that other landlords have the greatest encouragement to undertake the like improvements.

Even farmers, on ordinary leases, would find it their interest to plant fruit-trees in gardens properly exposed and sheltered. Or, the landlords might furnish the trees * (which would be well cared for), and lay their account with being well refunded for the expence, when the trees should become productive. A fruit-garden would add much to the value of a farm; as the produce of it, without risk or labour, would always find a ready market. But fruit-trees should not be confined to small gardens, where nature promises so fair for making orchards.

In designing an orchard, the first regard should be had to a proper situation; which should be moderately low †, and well sheltered; especially from easterly winds, which blow generally in the spring, and often prove fatal to the blossoms. A gentle declivity, facing the south or south-west, and screened from other quarters, is the most eligible. In the bosoms of woods, and along the windings of shores and valleys, such situations are to be found in abundance in every part of the county. If they can be got so as to ad-

ry trees, by budding or grafting on cherry stocks. Apricot trees are propagated by budding on any kind of plum stocks.

* In Devonshire, it is customary with gentlemen to plant nurseries for apple trees, which they give to any of their tenants who will engage to enclose a piece of ground for an orchard. *Agric. Rep.*

† In a very low and moist situation they are apt to canker.

mit of being occasionally watered, they will be so much the better; as orchards, no less than meadows, may be greatly benefited by irrigation.

In the next place, the nature of the soil should be attended to. A cold spouty soil is to be avoided. A dry clay loam is reckoned the best: and if we may not always have this, we have abundance of dry kindly loam, in which fruit, like forest trees, will be found to thrive well. If any particular spot in the soil is faulty, suitable manure may help to correct it. A cold heavy clay may be brought to a proper temperament by the application of horse-dung and ashes; and a light sandy soil may be mended by cow-dung and mud. The ground, if not trenched, should at least be prepared as in the common course of husbandry, if it is of such a nature as to admit it.

The choice of trees, or kinds of fruit, should likewise be regarded; for though almost any fruit is good where there is so little, yet this may not long be the case: and as the best are as easily raised as the worst, they ought to be preferred*. But what these are, must depend on taste and opinion, and each will naturally consult his own. As a general characteristic, however, it may be observed, that apples of red or yellow colour are commonly preferred; and that a large proportion should be of such as have the property of keeping well.

The trees should be planted very young; and if they have tap-roots, they should be cut off, in order to make the roots spread laterally, and near the surface. They will also thrive the better, if they are raised in poorer soil than that into which they are to be planted. The nurseryman, who has no further interest in the trees than to dispose of them, of-

* Some kinds will thrive where others will not; and the planter will deal most in those which he observes to thrive best.

ten raises his plants on rich soil, in order to make them look vigorous and healthy ; but it agrees ill with them to be planted again in worse. For this reason, gentlemen should not altogether trust to them, but should be at pains to raise trees for themselves. Stocks may be raised in abundance from the seeds of apples of young vigorous trees, and of good kinds, and the best of them chosen, when three years old, for being grafted. " The plants which have a large thick leaf, of " a dark green colour, and rather round than long, are the " best. Those which have the leaf long, hairy or bristly, " and deeply indented on the edges, are to be rejected." The stock should be grafted with the same kind of apple from which the seed was taken *, or with a kind as similar to it as possible ; so as at least to have the general character of sour or mellow. When the stock and graft are of the same parent tree, they not only unite more readily, but give a better fruit, and come sooner to bear. When they are of different kinds, the chief care is to suit the graft to the stock in point of luxuriance : for it is found that a luxuriant fast-growing graft does not succeed on a slow-growing stock, and *vice versa*. They should, therefore, be as similar in their growth as may be. A large growing kind of tree will agree ill with a puny crab stock. Crab stocks will, indeed, last longer, but they are longer of coming to perfection.

Grafting is so simple an operation, that any one who has once seen it performed, or is shown how it is done, may, with only a sharp knife, practise it successfully. The operation should be performed as expeditiously as possible, that the wound may be no time exposed to the air †. All the art is, to make the two barks (of the stock and graft)

* Some recommend the grafting of the plant into itself, by cutting away the leading shoot, and grafting a lateral one in place of it, to become the stem of the tree.

† The proper time of grafting is in February or March.

tally, to secure them by a ligature of new bafs or matting, well wetted with water, and to cover the bandage with the fize of a goole egg of clay, with mofs over it, fo as to exclude the fun and air, till the union of the parts is effected *. Or, instead of clay, a compoft of fand and new cow-dung may be ufed, as it is not fo ready to crack. Some think it beft to graft the trees, after they have been a year tranfplanted to the place where they are to continue, that they may meet with no check after they have been grafted.

In planting the trees, the holes fhould be made deeper and wider than barely to receive the roots, and fhould be dug a confiderable time before they are needed; that the foil may be loofened and mellowed, fo as to allow the fibres to extend eafily †. The roots fhould be carefully fpread in every direction, and none of them allowed to crofs another. If the ground is very dry and loofe, the trees may be planted in October and November, rather than in the fpring. Care muft be taken not to put them deep in the earth, to fet them upright, and to preferve them from being hurt by cattle while they are young. Any of them that may be expofed to cattle fhould have triangular frames to defend them.

Care fhould alfo be taken to train them to a proper form; keeping the branches at a due diftance from each other, and the middle of the tree open, when it can be done, in order to let every part have its fhare of air and funfhine. Decayed and ufelefs wood fhould be pruned off in winter, or early in fpring, with any low-hanging branches that may be within the reach of cattle. When the branches are pruned, they fhould be cut clofe to the point of feparation, which will make the bark clofe the fooner, and more quickly heal the

* Towards the end of May or beginning of June, the clay and bandage fhould be taken off.

† The growth will be the quicker if a little good mould and lime, or rotten dung, be mixed with the earth about the roots.

wound. Any young shoots growing where a branch was cut, should be rubbed off (not cut) as soon as observed in the spring. If any branch will be in the way of others in two or three years hence, it is better to cut it now; for the sooner that this is done the better. The wound will be less, and will sooner heal.

In five or six years from their being grafted, trees commonly bear; in thirty they are at their prime, but continue in vigour till sixty; or, if pear trees, to a hundred. Good bearers will often yield a hoghead of liquor, worth a guinea; and pear trees will sometimes yield two. When they do not bear, cutting a circle through the bark round the principal branches, will stop the growth of wood, and give a tendency to bear fruit instead of wood; and lime dissolved in water, and applied with a brush, will destroy moss, which is hurtful if allowed to grow on them. Blotches (occasioned by the stem growing too fast for the bark) are cured by scoring the bark with a sharp knife, but not so deep as to cut the inner rind.

In digging occasionally about fruit trees, care must be taken not to wound any of the roots. The fruit should also be taken away gently, without beating the trees, and hurting their buds, which might prevent their bearing fruit the following year. The mark of apples being ripe, is their falling spontaneously from the tree. They are preserved from frost by laying straw under and over them; taking care to pick out any that may be damaged before they spoil others.

As gooseberries and currants are so easily raised from the slip, and come so soon to perfection, no garden whatever ought to be without them. All the care they require is to dress and dung the ground, to train them from one stem, to keep them free of suckers, and light of wood. Where there is a superfluity of small fruit, and the market distant, it may be converted to a wholesome and palatable drink, by making

it undergo a vinous fermentation; and such colour, flavour, and strength, may be given it, as to make it resemble and equal imported wine. Raspberries and strawberries, white or red, will help the colour and flavour, and a proper quantity of spirits, with sugar or honey, may be added to make it strong and rich. A respectable family, lately in this county, used to make a considerable quantity of such liquor, which was generally preferred to foreign wines, when both were set down on the table. As there can be no doubt but wines more wholesome and palatable than most of those that are imported, could be made from our own fruits, it would be of great importance to the nation, if persons who have skill and opportunity should, by a proper series of experiments, ascertain the best process of making them in small quantities for the use of private families, and make the art more generally known*.

* It appears from Mr. Pennant's Account of London, that this business is carried on there upon a large scale, and to an immense extent. He computes that half the port, and five-sixths of the white wines used in that great city, are made of the fruits which grow on the genial banks of the Thames.

CHAPTER X.

WOODS AND PLANTATIONS.

A GREAT part of this county was once covered with wood, of which every moss still shows the remains. It might have been then as desirable to get rid of some of it, as it is now to rear it. But, as it often happens, men ran from one extreme to the other, and the loss was severely felt before any attempt was made to repair it. Even so late as the commencement of the present century, the woods in this county, though then sufficiently reduced in quantity, were held to be of so little value, especially in the inland parts of it, that a large fir wood in Glénurchay was sold to a company of Irish adventurers, for so mere a trifle, that, it is said, it came to no more than a *plack* (or third part of a penny) per tree. Some time after that, however, the remaining deciduous woods in the county were brought into greater estimation, by means of two English companies who set up iron forges, the one near Inveraray, and the other at Bunaw. Ever since, our natural woods are in general tolerably cared for; and though the long leases granted to those companies, of some of the woods, and the want of a sufficient competition for the rest, has hitherto kept some of them low; yet they are always of more value to the proprietors than any other equal extent of ground, arable land excepted.

The value of woods, however, varies according to their situation, closeness, and proportion of oak; and according to the degree of care with which they are saved, and of skill with which they are managed. In some cases it may not average 5s. a-year per acre; and in others it may exceed 20s. The woods are commonly cut at the end of every nineteen or twenty years, except such a number of oak standards as parties may agree to spare. So much of the

timber as may be needed for country use, is sold, perhaps, as high as anywhere in the kingdom; the rest is made into charcoal, and the oak bark sold for the use of the tanner*. The wood is then enclosed, commonly for six or seven years; during which time, however, some allow it to be pastured by horses. Some thin or weed their growing woods, by taking out such a number as it may spare of barrel hoops. When this is done with judgment, it is thought to be in favour of the wood; but others leave it to nature, and allow the stronger plant to destroy the weaker. The more attentive proprietors of wood are also at pains to encourage the growth of oak, by cutting away any other wood that interferes with it. But some few there are, who, with a shameful inattention, altogether neglect several patches of natural wood on their estates, which could not fail to be of great value, if cut and properly enclosed and cared for.

Such as have extensive woods, and follow the practice of cutting them once in twenty years, might manage them with more care, and derive a more steady income from them by dividing them into twenty lots, and cutting one of these every year. The season of cutting oak is when the bark rises, from the beginning of May till Midsummer. The trees should be cut and peeled close to the ground, that the young shoots may spring from the ground rather than from the old stock. The stocks should be cut clean and rounded, that no water may lodge upon them, which would make them rot. The fences, which ought not to be temporary but permanent, should be in a sufficient state the moment that the wood is cut; and the timber and charcoal removed, as soon as possible, in order to save the young shoots from injury. And then, instead of excluding cattle for six or se-

* Oak bark sells at present (1795) so high as twelve guineas per ton. An acre of good oak wood, at twenty years old, is said to yield about 200 stone, Dutch weight, of bark.

ten years, perhaps it would be better to exclude them altogether. The value of the grafts after that period is trifling, and the injury to the wood may be considerable; especially by their destroying the young plants which shoot up in vacant places. Such vacancies should be planted, when the wood is cut, with trees suited to the soil, giving always the preference to the oak where the ground is dry. Care should be taken that the trees which are left for standards should be healthy and vigorous, such as have grown in open roomy places without shelter, as otherwise they will not bear to be exposed; and they should by no means be deprived of any of their branches. At the age of five or six, and ten or eleven, and fifteen or sixteen years, they may be weeded, and thinned where needful; but this should be done by persons of skill and judgment. The hoops got from these thinnings will bring a considerable profit. When a wood is near a good market for hoops, some think that the most profitable use that could be made of it would be to devote it wholly to that purpose; but this opinion would need the confirmation of some experience.

The extent of ground occupied by natural woods on the continental part of this county, having never been measured, cannot be ascertained. It may probably be about 30,000 acres. But this bears so small a proportion to the extent of the county, that many large tracts of it appear altogether bare and naked.

Of plantations we have not a great many, nor can we boast of the extent of any of them, except the Duke of Argyle's, which may be ranked among the greatest in the kingdom. This improvement, however, has got a beginning in most parts of the county, and it is hoped it will go on, as in other parts of the kingdom. It is, indeed, the improvement most needed in this county; that for which its soil, climate, and situation are best adapted, and that which will

prove most beneficial to the public, and most advantageous to the owners.

The scarcity of timber, even for the use of the farmer, is severely felt in most parts of the county. In Kintyre especially it is brought from a great distance, sometimes fifty, sometimes an hundred miles. Other parts of the county are not much better accommodated, except at particular times, when woods are cut for making charcoal. Then, indeed, the farmer may have some small timber, though not cheaply; but the opportunity does not return again till nineteen years are revolved. This inconvenience to the farmer must ultimately alight on the landlord, who should therefore take speedy steps to remove it.

A taste for comfortable dwellings is now become general, even among the common people; which, if they could easily indulge it, would greatly contribute to their health and happiness: but as long as, by the neglect of planting, the timber for this purpose must be brought all the way from Norway, no general improvement in this respect is to be looked for.

As the people of this county are almost all borderers upon the sea, it is natural for them to turn their attention to that great source of riches. Many of them have done so, but at a vast disadvantage. Having no timber of their own to build their vessels, they have been obliged to bring it from Wales and Norway, and to pay sometimes more than the original cost for the carriage. Had they timber of their own, their industry would have been exerted to double the advantage it has been, and the people would have no occasion to emigrate; for their prosperity, the reverse of what it is now, would be in proportion to their numbers. It is impossible to calculate how much the people of this county have suffered from their want of timber since a spirit of industry and adventure has sprung up among them, or what a check this want

must prove to the further exertions of that spirit, if speedy measures are not taken to supply it by planting.

Sheep and mountains, though highly prized, are far from being the chief advantage of a maritime county like this, everywhere indented with deep bays, creeks, and safe harbours. It is surely from the sea that nature intended such a county should derive its principal advantages; and in the number of its people, and in their industry being properly directed and encouraged by the landlords, must consist its principal riches.

The soil or produce of a country is never of so much account to it as a happy situation. Hence the finest tracts of the globe, in a very inland situation, are, and have been, always barren, and the people barbarous and poor; while the most barren spots, with the advantages of the sea, have raised their inhabitants to riches and to power. The Dutch republic is not four times the size of this county, nor did it produce four times the corn * which this county is capable of producing, when it had nearly reached the summit of its power. This power sprung entirely from its situation. This turned the attention of the inhabitants to fisheries; fisheries furnished them with seamen; seamen produced trade and commerce; and these created riches and power.

It is therefore wise, as well as humane, in the greatest proprietor in this county to encourage population by giving small possessions, to patronize fisheries, and to raise forests for a people whose situation naturally leads them to be seamen. It was by the sea and by its forests that this great county anciently rose to such eminence as to hold the balance of power among the surrounding hordes of nations †; and it is

* "It is said that all the corn raised in the United Provinces of Holland will scarce maintain the labourers employed upon its dikes." *Political Survey*, I. p. 14.

† In the beginning of the 8th century, the fleet of *Dalruadbaín* (now Camp-

by the same means that it must expect to rise again to that degree of consequence at which it is capable of arriving. The period may be distant, but the plan is sure; and the nobleman who has so steadily pursued it may have already the pleasure to find that all England could not, about 200 years ago, produce twenty times the tonnage and mariners which one town on his estate, sprung lately from a small fishing village, can at present furnish †. And of such towns we might have had a number, did all our landlords encourage population, by giving small or moderate possessions, and did the county furnish abundance of timber for the constructing of vessels. Let forests be raised for a maritime people, and they will soon convert them into ships; and these ships will create trade and commerce, introduce manufactures, build cities and villages, beautify and improve the country, and raise the value of land and of its produce.

The necessity of raising such forests will appear to be still greater, if we consider that oak timber is daily becoming scarcer in England, and its price advancing there; as that of all timber is with us, for the little that we have of it costs even the farmer twice as much as it did ten or twelve years ago, and it is still rising. In such circumstances, this county, which is so well adapted for raising timber, ought to provide not only a sufficiency for itself, but a supply for others. Thus might we bring back the large sums which

belton) was sent for to decide the contest about the succession to the throne of Ireland. In the 12th century, the fleet of Somerled of Kintyre, consisting first of 53, and afterwards augmented to 160 sail, enabled him first to shake off the Danish yoke, and afterwards emboldened him to contend with Malcolm IV. For a long time after, the fleet of this county was so powerful, that the kings of England and Scotland by turns courted the friendship of its little sovereigns, the Macdonalds.

† In the year 1582, mariners of all sorts in England were 14,295, and the tonnage 72,450. *Political Survey*, l. 161. and *Hume's History*, V. 500.

we have already given away for timber, and be able to pursue, with more effect, the line which nature points out for us by the very form and situation of our country.

Besides, timber should be planted for shelter and for fuel, and some regard is due even to ornament. To provide shelter for cattle and sheep in winter, is a matter of great moment. In inclement seasons this would save the lives of many of them; which, for want of it, must continue to perish. Shelter would also give an earlier spring to our grass and corn, and abundance of woods make the whole country of a different climate from what it is at present. It is now matter of astonishment to the inhabitants of this county to find, in some parts of it, the traces of corn-ridges covered with heath, so high in the hills that no corn could grow there at present. This shows how much warmer the country was when mantled over with woods and forests. An annual fair has for many generations been held in Glenurchay on the eighth day of March (O. S.), and some old men, who died about the beginning of this century, used to tell that when they were boys (and living in *Bocard*, one of the highest farms in the parish), it was always a mighty dispute who should, on this great occasion, stay at home to keep the sheep out of the springing corn. But there nobody now would venture to sow corn so early. The country is bared of its woods, and the climate is changed.

Peat moss, in many parts of the county, is becoming extremely scarce; and even where it abounds, the season most favourable for agricultural improvement is consumed in making fuel of it; for this requires almost all the summer. Would it not be of great importance then to raise timber, even for the sake of fuel; especially where moss is scarce or distant? A few acres of land, now of little value, might be made to furnish a farm for ever with coppice wood for fuel, by a lot of it yearly cut in rotation. In many parts of

England better soil than ours is appropriated to this purpose, which may satisfy us that a little of our poorer land could not be better applied.

It is almost unnecessary to say that the soil, climate, and situation of this county, are remarkably well adapted for planting and raising timber. The soil is generally dry, the climate warm and moist; the situation almost every where commodious for water carriage, and the surface of the country is so uneven that every part of it abounds with shelter. The remains of large trees found in every moss, from the Mull of Kintyre to almost the top of the Grampian Hills, show that timber once grew where now it is not, and that it might be made to grow there again. If one were desired to name one spot in the county where trees could not possibly grow, he would probably say it is the farm of Ross-hill in Kintyre, which stands on the face of a hill or promontory, fronting the great opening of the Atlantic Ocean between Illy and Ireland, and having no land between it and the continent of America. Yet in the mosses of this highly exposed farm, are found the trunks of trees, which show that even here it is possible to rear timber. Among the highest and bleakest of our mountains, many venerable trees may still be seen, perhaps 2000 feet above the level of the sea*; though they have not now as formerly the advantage of large forests to give them shelter.

If trees are planted thick and in large clumps, there is hardly any situation in the county so untoward as to prevent their growing. Some of the outer trees may be stunted, but the great bulk of them will thrive. Of the Duke of Argyle's immense plantations, some are in the direct face of the sea

* This may be under the mark, as in other parts of the Grampian Hills fir roots are said to be found near 3000 feet above the sea-level. *Stat. Acc.* XII. 473.

breezes, and in the most exposed situations, and all thriving. In these plantations one meets with oaks from 8 to 10 feet in circumference; ashes and planes from 9 to 12; beeches, elms, and chestnuts from 12 to 14; and all in a growing state*. The lesser and later plantations in every part of the county are equally thriving, where the size of them is not too diminutive. At Inverneil firs of 20 years old measure three feet in circumference; and at Gartnagrenach some of 35 years old, planted in a natural wood, measure from five to

* The following specimen of the size of different kinds of trees at Inveraray, was furnished by James Ferrier, Esq. agent to the Duke of Argyle, who, with his usual zeal and attention, took the most active interest in every thing which related to the Agricultural Report of Argyshire.

	<i>Length of Stem.</i>	<i>Girt.</i>	<i>Diam. of the Head.</i>
	Feet.	Ft. In.	Feet.
Oak,	26	9 4	40
Plane,	24	11 6	60
Beech,	12	14	90
Ash,	32	10 10	
Scotch elm,	28	11	
Scotch fir,	36	10	
Spanish chestnut,	18	12 6	
Silver fir,	32	9	
Larch,	20	6 6	
Norway spruce,		7	
Weymouth pine,		6	
English elm,	20	8	
Mountain ash,	12	5 3	

"The oldest and largest of the trees at Inveraray are supposed to have been planted by the Marquis of Argyle betwixt the years 1650 and 1660. These of the next largest size and age were raised from the seed by Archibald Duke of Argyle in 1746 or 1747. These consist chiefly of larches, New England pines, spruce and silver fir. The distance betwixt the trees varies, but may be in general from 30 to 50 feet. The soil and climate, as far as experience goes, are favourable to the growth of all kinds of trees."

fix, though standing on barren rocks, where one would think there was not earth enough to feed an ear of corn. In short, wherever there is a sufficient number of trees, natural or planted, their clear shining bark, luxuriant shoots, and thick foliage, give a sufficient proof that the soil and climate are remarkably well adapted for the growth of timber, and invite the hand of the planter to raise it.

But in order to induce him to this, we must first show the profit that is to be had by planting. This cannot perhaps be stated with accuracy, as so much depends on the varying circumstances of soil and situation. Even a good natural wood or coppice may be reckoned to produce 20s. a year per acre*. But should it be stated at only one half of this, it would be a vast improvement on land capable of no other, and in its present state of little value; for it is chiefly such land that ought to be planted. This profit, however, is little to what may be expected from a good plantation; as in that case the planter has the choosing of his own timber.

The expence of planting will depend much on the size of the enclosure; the expence per acre being always less in proportion as the enclosure is larger. The fencing of an enclosure of 20 acres exceeds a fifth of the cost, though it is but the 25th of the space, of one of 500. In the north of Scotland, "the expence of enclosing a plantation of at least 100 acres, and planting it with Scotch fir, is generally calculated at 20s. per acre, and the undertaker upholds the plants for seven years†." In the east of England, the expence of enclosing and planting is said to be 3l. per acre‡.

* It is estimated at this in Dumbartonshire; at from 8s. to 25s. in Stirlingshire; at 28s. in Somersetshire; at 40s. in Wiltshire; at above 5l. in Essex. *Agricultural Reports.*

† *Agricultural Report of Northern Counties*, p. 107.

‡ *Young's Tour*, I. 330.

Let us take the medium between the two, and suppose a plantation of 500 acres to cost 1000l. or 2l. per acre. In most cases, much of the expence of enclosing will probably be saved by sea-shore, gulleys, precipices, and other advantages of ground. The plants too may be raised from the seed, and set by the planter's own servants, at a small expence; or, instead of plants, the seeds of trees may be sown in the plantation, by which the expence will be greatly lessened. But, without reckoning on these savings, let us abide by the first estimate of 2l. per acre, and proceed to calculate the return.

Suppose, then, that at the end of 11 or 12 years, only two thirds of 5000 plants, originally set in the acre, are found to have done well; of these, one half, or 1666, may be taken away for railing, firing &c. and if sold so low as a half-penny each, they will come to 3l. 9s. 5d. which will more than defray the original expence with interest*.

From the age of 16 to 25, a thousand more may be gradually taken out of the acre,

which, at 4d. each, will make

L. 16 13 4

The 666 remaining on the acre will, at 50 years, be worth 2s. 6d. each †

83 5 0

L. 99 18 4

This divided by 50 will give about 2l. a year for the acre, and near 50,000l. from the whole plantation, without rec-

* "Were one half of them then (at 11 or 12 years) cut and sent to the Newcastle collieries, or to the River Thames for hop-poles, it is said they would fetch money enough to reimburse the whole original expence of the "plantation." *Agricultural Report of Angus and Forfar.*

† They are commonly valued higher. In Somerset 2s. 6d. is thought a low computation for them at 30 years old, and 8 1-half feet distant; which will make 100l. the Scotch acre. In Rosshire, which abounds with plantations, and where Scotch firs are therefore cheap, they sell at 50 or 60 years old from 2s. 6d. to 3s. 6d. each. *Agr. Rep.*

loning interest on the thinnings, or any advantage of grafs and shelter which the plantation may give to cattle after they may be let into it with safety.

It was intended that the above calculation should be moderate, and therefore the average price of all the trees was stated at the value put upon the Scotch fir, the meanest tree perhaps in the plantation. But if in any respect the statement shall be thought too high, there is room enough for deduction, and still the profit will be undeniably greater than what can be obtained from almost any other application of money. Better judges, however, have calculated the profit at a still higher rate. Mr. Pavier (in the Bath Papers, Vol. IV.) computes the value of 50 acres of oak in 100 years to be 12,100*l.* which is about 3*l.* 2*s.* 6*d.* each year per Scotch acre; and Evelyn calculates the profit of 1000 acres under oak to be in 150 years 670,000*l.*, which is 5*l.* 12*s.* a-year to each acre, of the same measure. But the profit stated above, though more moderate, gives abundant encouragement for planting. The outlay is small, the return is great, the land proposed to be planted is fit for this improvement and no other, and its value will be raised from almost nothing to that of the best arable land in the kingdom. At the very highest at which the expence of the improvement can be reckoned, it falls short of two or three years profit of the improvement; so that the advantage is greater than that of buying land at only three years purchase.

But as calculations in theory are apt to be suspected, it is proper to add a few experiments to confirm them. "I have "a small piece of ground (says a writer in the Bath Papers *), "planted in 1764, with various kinds of firs mixed with young "oaks. The firs have been felled by degrees for rails, joists, "spars, and other uses, to the value of 25*l.* and have left a

* Vol. V. written in 1790.

"grove of healthy and promising oaks." Here the very thinnings of little more than half an English acre brought about 20s. a year to the planter.

"Of Wavedon heath, 19 acres, which could not be estimated at more than 2s. the acre, were planted with Scotch firs in 1778. In 1794, considerably more than the expence of enclosing and planting was found to be repaid by the thinnings, and 17,125 trees left, valued at a moderate estimation at 684l. and in the way of advancing more rapidly than before *."

Mr. Young, in his Tour through the East of England †, gives the following account of what the plantations of Mr. Mellish are found to render "from experience."

Clear profit in 20 years, 69l. 12s. 6d. or 3l. 9s. 1d. per acre per annum.

Or (if allowed to stand), at 30 years, 116l. 12s. 6d. or 3l. 17s. 1d. per acre per annum

Or (if allowed to stand), at 40 years, 213l. 12s. 6d. or 5l. 6s. 1d. per acre per annum.

He states the plantations of Mr. Fellowes as being still more productive, yielding a regular income of 5l. a-year per acre, by being cut in a regular rotation. "Suppose, then, only a single acre planted every year, at the end of 18 or 20 years, an acre a-year will be cut down, and a regular income of 100l. annually will be derived from only 20 acres. "What a beneficial improvement ‡!"

* *Agricultural Report of Buckingham.*

† Vol. I. p. 330, &c.

‡ *Ibid.* Vol. II. p. 129. In Vol. III. p. 211. Mr. Young states the profits of Mr. Mitford, who allows his plantations to stand till they are 40 years old, as high as 22l. 11s. per acre per annum; and remarks, that "to reap above 20l. an acre from the first day of planting, exclusive of thinnings, is a profit that shows how fine a resource landlords have for raising large sums of money, when they can wait for such a period for the return. But had these trees been cut at 20, 25, or 30 years, the profit would have been very great, though

The grounds planted by the Duke of Argyle, being mostly a barren heath, might not, in their natural state, 40 years ago, be worth 50*l.* a-year*. And yet there can be no doubt that at present a million of the trees planted upon those grounds may, at a low average, be estimated, one with another, at 2*s.* 6*d.* each, which would amount to 125,000*l.* †. Now the annual interest of this sum is 6250*l.* or 125 times the original rent of the ground which they occupy; so that it must have grown in value at the rate of three rents for each of the 40 years.

How astonishing is it then, that in a county so well adapted for planting, the general attention of proprietors of land is not turned to an improvement of such advantage. The only reason that can be given for its being so much neglected is, that the gain appears to be distant. But the owners of land should consider, that if they should not live to sell the trees which they plant, their estates are increased in value, and improved in beauty, and that the plantings would almost at any time sell for more than would repay them with interest. The firs in a plantation, after a few years, would return them a large annual profit, and the oaks would be a fortune for their children.

That the profits of planting are distant, is a mistaken though common notion, which it is of consequence to correct. The following measurement taken of trees that were only 21 years planted, will show what may be expected in tolerable soil and shelter, such as we have in abundance.

“not so high as at 40 years. The value of the fee-simple of land, soon after planting, bears no proportion to the value of the timber on it. Is not planting, therefore, a ready way to double, triple, and quadruple estates?”

* In 1751, the valued rent of all the parks (polities) about Inveraray, consisting of 12 1-half marklands, is stated at 50*l.*

† This calculation is moderate, compared with that of Mr. Knox, who (in his Tour) reckons there may be two millions of trees worth 4*s.* each, which would amount to 400,000*l.*

		<i>Height.</i> Feet.	<i>Girt.</i> Ft. In.
Lombardy poplar,	from	60 to 80	4 8
Arbele, or white poplar,	—	50 — 70	4 6
Plane,	—	50 — 60	3 6
Elm,	—	40 — 60	3 6
Scotch fir,	—	30 — 50	2 10
Larch,	—.	50 — 60	3 10

The ash and beech grow nearly at the same rate with the elm; and the spruce and silver firs rather faster than the Scotch. The oak does not grow so fast; but, as we shall see afterwards, it pays better. In the meantime we may observe, that whoever considers the value of trees of the above dimensions, and that near 700 such trees, at nine feet distance, may stand on a Scotch acre, need not wonder to find a very competent judge * assert, that planting land, even on a lease of 21 years, would be more profitable than any other improvement, as it would give a return of 6l. an acre, with no risk, and little expence or trouble. "Lord Donegal's steward planted 100,000 trees, and told his master they would be worth 100,000l.; and it is supposed his Lordship may see the prediction fulfilled, as some of the trees are already worth 15s. each †." How many come to their estates at from 20 to 25 years of age? "Suppose such landlords (says Mr. Young ‡) to plant then 100 acres, they may reap more than 60,000l. by the time they are 65; and that from poor

* *Young's Tour through the East of England*, Vol. II. p. 129. But by the law of Scotland, a tenant is not allowed to cut the trees which he has planted.

† *Agricultural Report of Staffordshire*. BLITHE gives an instance of one who planted 100 ash trees, and in 50 years after sold them for 500l. *English Improver*, c. 25.—A. Hamilton, Esq. "lived to see trees which he planted, after he became a lawyer, grow to 12 feet in girth." *Stat. Acc. of Dalziel*.

‡ Vol. III. p. 225.

“land unfit for husbandry.” And if a plantation be worth this much at such a period, may it not be fairly reckoned to be worth at least a third of it even at the end of 20 years; as the horse that will bring thirty guineas at six years of age, may be estimated at ten, when he is only two; though then unfit for service?

What has been said may serve to show that the profit of planting is not only great, but also far from being distant. Let us now consider what are the grounds which ought to be marked out for this improvement. The best land would no doubt bear timber best; and if arable land could be spared for the purpose, the return might be expected to be in proportion to the value of the soil. But in this county little or no arable land, meadow, or good pasture, ought to be laid under planting. It should have only those waste grounds which are capable of this improvement, and of no other.

Of these we may reckon, first, those extensive dry moor-lands and moor-lands, in the hollows and on the declivities of hills, especially in the inland parts of the county. These lands are generally covered with short heath, mixed with so little grass, that they are not worth 6d. the acre. The trunks of trees generally found in them give, however, a sufficient proof of their aptitude to grow timber, and they can never be turned to better account than by planting them; and that with the same kind of timber that is found in them. This is generally fir, and sometimes oak. Whatever it be, follow nature, and you cannot err. It may be said that some of these situations are far from water-carriage. But the whole county is so indented with seas, and so well accommodated with roads, that almost every mountain is accessible by the one or the other. Or, if any of them be not, still it may be profitable to plant it, were it only with a view of converting a great part of the wood to the purposes of

extracting from it turpentine, tar, pitch, rosin, and of making potashes*.

Another kind of ground which ought to be planted, and of which we have large tracts, is that which is covered with brushwood, such as hazel, birch, &c. seldom allowed by the cattle to rise above two or three feet high. Here nature, which could not be mistaken in the soil, has planted wood, though it has not been allowed to grow, and has marked out the ground as fit for planting. This brushwood will prove an excellent nurse to young plants, by giving them shelter till they raise their heads above it; after which they will destroy the brushwood (by excluding the sun and air from it), and reduce it to a manure which will help their growth †. Among this brushwood, however, there may sometimes be found some sprouts of oak and ash, which ought to be cut over a few inches above the ground; after which they will shoot up and thrive exceedingly, from the abundance of roots which they have to nourish them. Patches of dwarfish oak, which the cattle never allow to rise one foot from the ground, are also common in many parts of the county. If these spots were brought within the enclosure of a plantation, and the bushes cut over a little above the surface of the ground, they would soon be valuable. In England, even oak plants are often cut in this manner after one or two years, when they have taken to the ground, and the second shoot is trusted to for the tree; as it is found to grow with greater luxuriance than the first, which was checked by transplanting ‡.

* See on these subjects *Agricola's Letters in the Scots Mag.* Vol. XXXIII.

† Whins, broom, any kind of furze, or even heath, will help to nurse and shelter young plants.

‡ *Agricultural Report of Stafford.* Dr. Hunter (on Evelyn, Vol. I. p. 83.) recommends this when the plants are two or three years old, if they are stunted or crooked.

Stools of natural wood, wherever they are, furnish much room for planting; and at a trifling expence, when they are already enclosed. Every vacancy in them ought to be filled up with oak, ash, elm, and other valuable kinds of timber. The ground is suitable for planting; the natural wood will shelter it; and thus it will thrive well, and improve the coppice. The properest time for improving a natural wood with planting, is immediately after it is cut, when the fences are in best repair, and when the sun and air will get at the plants which may be set among bushes of less value. These bushes should afterwards be cut down, if they are found to hinder the growth of the planting. The Duke of Argyle has done much in this way, and Lord Stonefield, Sir James Campbell, and several other proprietors, have thus improved their natural woods very considerably. Last year, Captain Campbell of Kintarberr, with a spirit yet uncommon among the most of the proprietors of this county, has planted among his natural woods no less than 20,000 trees of valuable timber. At this rate, he will, in a few years lay the foundation of a sure and large fortune.

A fourth kind of ground that should be devoted to planting, is that on which a number of venerable native firs are still growing. These memorials of our former forests are not unfrequent in some of the upper parts of the county, particularly in Glenety and Glenurchay; and they deserve more attention than they have hitherto met with. From the seed which they shed in winter, and which is driven to a distance by the storm, a beautiful plantation rises up in spring; but when the cattle are driven up to the mountains in summer, this precious crop, the hope of future forests, is for ever destroyed. This is the more to be regretted, as the quality of this fir is so excellent as not to be surpassed by any in the world*. The seed of this fir is precious, and a single cone

* Some of this wood, after it had stood above 300 years in the roof of an

of it, if possible, should not be lost. But then, in order to preserve its valuable quality, it should be sown where it is meant it should grow, without passing through the medium of a seed-bed or nursery.

It is natural to suppose that the Scotch fir raised in our plantations came originally from the seed of our own forests, and that it has lost its native quality by passing through the nursery and being again transplanted. It is well known that all seeds, if not frequently changed and renewed, will soon degenerate. But no such attention has been paid to the Scotch fir, and yet we complain of its quality, when worn out by repeated semination. Perhaps no tree requires more to be left to its natural disposition. In an island at the foot of Glenurchay, there was lately an old fir plantation so near the natural fir wood of *Coir-uarain*, that it may well be supposed that, even without the medium of a nursery, the plants were picked up in the forest, where they annually spring, and only transferred to the plantation; and yet the quality of the planted fir, at a mature age, was altogether inferior to that of the spontaneous growth. It appears necessary, therefore, in order to preserve the quality of the timber, that we should follow nature, and sow the seed directly where we intend the tree should grow. The seed too will thrive where plants would fail.

The remains of these forests too, thin as they are, should no longer be neglected by the owners, who would greatly promote their own interest and that of the public by attending to them. They should either be enclosed and encouraged to spread their valuable timber, or, at least, careful persons employed to save the young plants from being devoured

old castle (*Kilchurn*) in Glenurchay, was, when taken down some years ago, as fresh and full of sap as new-imported Memel, and part of it actually worked up into new furniture.

during the summer months, when the cattle are in the hills. By this trifling expence and attention they would soon spread amazingly. In England, when fir plantations are cut down, the replanting is often effected by leaving a few of the old trees at 50 or 60 yards distance; for, so far the seeds will be abundantly scattered by the storms. In a moor in the parish of Little Dunkeld in Perthshire, a fir wood of 300 acres has thus arisen from seed driven by the wind from old trees, within these 30 years; and a considerable part of these self-propagated trees are held to be worth already from 1s. 6d. to 2s. 6d. each *. Supposing 700 of these trees to stand on each acre, the whole will be worth 10,500l. It is hoped that such of our proprietors as have it yet in their power, will consider how much their interest is concerned in thus reviving their natural fir woods, and extending them at pleasure. So cheap, and yet so important an improvement, cannot be sufficiently recommended. Why should we go to Norway for timber which our own barren hills might furnish at so small an expence?

After some hesitation about parting with any thing that we call arable ground, I shall mention one other kind of land, which it may sometimes be proper to devote to planting: I mean some high fields, which, under the old system of cultivation, were subject to the plough, but never to much advantage. These poor gravelly fields were manured by folding cattle on them at night. But now, where this system is given up, they lie neglected, and many of them are already covered with heath. With little expence, and much advantage, they might be converted to plantations. The earthen dikes which surround them might be faced with stones, of which the dikes themselves would furnish a great proportion. The tops of the dikes might be planted with firs, if not with

* Stat. Acc. VI. 360.

quicksets, for more fence and shelter. The fields should then be ploughed, and, if at all convenient, dressed with some lime or other manure, and sown with the seed of the native Scotch fir and with acorns. By this preparation of the ground the trees would thrive amazingly, and the wood retain its native quality.

Of the different descriptions of soil mentioned, and proposed to be planted, it is difficult to say how much there may be in this county. But let us suppose that, of 25 entire parishes on the continent, each at an average might easily afford six square miles for planting, or 150 in all. Now, according to the calculation made above (p. 139.), and which was shown to be more moderate than what the calculations of others, or rather experience, might justify, this extent of ground occupied in planting would for the first 50 years (though less productive than the following) yield an annual profit of 150,000*l*.

To those who are unacquainted with the profits of planting, or who have not sufficiently reflected on the subject, this sum may appear to be enormously high; but to others who are better judges of the advantages of this great improvement, it would certainly appear to be extremely moderate. The author of the *Political Survey of Great Britain* *, who may be allowed to be a sufficient judge, computes that
 “ one tenth part of the land in the county of Sussex (216
 “ square miles), properly planted, would be more beneficial
 “ to the nation than the discovery of a mine that produced
 “ half a million Sterling annually, without taking into con-
 “ sideration the number of people destroyed by working
 “ mines, or even the consequence of those numerous manu-
 “ factures the product of such woodlands would support,

* Vol. I. p. 382.

“ which, as will be easily conceived, must exceed that sum
“ many times told.”

In the present situation of this country, planting is undoubtedly the most productive improvement that can be thought of : and the more that the kingdom shall advance in wealth and power, the more will timber be held in estimation ; so that there can never be any danger of its finding a market. Besides, the poorness of the soil proposed to be planted, and the great conveniency of water carriage, and other peculiar advantages of situation, will always enable this county to bring its timber to market cheaper than perhaps any other in the kingdom. Every landlord in the county ought therefore to keep this great object ever in his view, and most of them ought also to attend to two more : for most of our grounds may be appropriated to three uses, and, as it were, divided into three regions. The *first*, which is generally the lowest part, ought to be appropriated to cultivation. Whatever is capable of cultivation, be it cultivated ; that the food of man and beast may be increased, and that the number of both may be multiplied. The *second* part, which may commonly be considered as lying immediately above what is or may be cultivated (though in some grounds it may come to the shore or river), is that which should be devoted to planting. In short, all that will grow timber, but not yield corn, hay, or very good pasture, ought to be turned to this use. And then the *third* region, or highest ground, that will not give either corn or trees, should be allotted for sheep, when it is of sufficient extent for a sheep-walk ; for of such grounds this is certainly the most profitable application yet discovered. Nor would these favoured animals be losers by this distribution of the ground, as the shelter of the woods and the cultivation of the lower grounds would soon compensate in winter for what they should lose of their usual range in summer. Whoever pursues this threefold plan may

certainly bring his estate soon to the highest value of which it is capable *. But of the three objects, planting, though most neglected hitherto, is certainly the most productive, in any suitable situation.

After specifying the grounds that should be consigned to planting, it may be proper to add a few hints in regard to the choice of particular situations. And on this head it may be observed, that those places should be as much sheltered from the west wind and sea-breezes as may be. Trees properly cared for, and raised directly from the seed, in large plantations, where they shelter one another, will, as already observed, bid defiance to those blasts, which will only affect the outer edges of the clumps or plantations : but as they are rather unfriendly to vegetation, one should avoid them when he can. The outer trees of any plantation much exposed to them are often stunted on the stormy side, and observed to turn their heads to the opposite direction. Sometimes, however, it may be necessary to plant even in such situations. When it is, the pinafter, or sea-pine, is perhaps the fittest for being planted on the stormy edges. " It is hardy, and " makes vigorous shoots almost on the sea-beach, and is an " excellent defence for other trees †."

* The late General Sir Archibald Campbell, distinguished for correct taste and judgment, seems to have had this idea in laying out his grounds at Inverneil. All that was cultivated, or capable of being so, was first cut off by one general enclosure at the bottom. Without this, and above it, a considerable tract (which had he lived he would no doubt have enlarged afterwards) was cut off and planted, allowing the plantation to descend to the shore, where the ground was poor, and incapable of being cultivated; and the high lands above both enclosures were left for sheep or other cattle. Sir James, in following out his brother's plan, will probably extend the planting as far up the hill as it will grow, which it was prudent not to attempt in the first instance; but it may be done by degrees, as one belt or tier will shelter another.

† See *Stat. Acc.* I. 244.

When any of the ground to be planted is wet or marshy, it will be necessary to carry off the superfluous water by open drains or ditches. But this will be rarely the case, as most of the soil proposed to be planted lies on poor hanging grounds covered with heath. Even those parts of it which are almost covered with rocks and stones should be planted; for trees, at least by sowing the seed, will thrive where there is hardly any visible soil to feed them. They probably derive much less nourishment from the ground by their roots, than they do from putrid vapours, air, rain, and sun-shine, by their branches*.

In fixing the place for a plantation, it may be proper to observe in what situations natural woods thrive best in any neighbouring grounds, and to choose such as are similar: also to observe to what height trees thrive on the sides of any neighbouring hills, in order to keep within the mark. The hill must be low, before it can be planted to the top at first; though it may afterwards be done by degrees and perseverance.

In making a large plantation, regard should be had to the convenience of a road or water-carriage; and to every advantage that may be had from precipices, gulleys, sea-shore, and other enclosures for boundaries, in order to lessen the expence of enclosing. For the same reason, the corners of fields or enclosures already made, may be easily planted, as two parts of the work are already done, and nothing remains but to make up the third with a fence or paling. Such small clumps will soon be of service, by giving shade and shelter to cattle.

* This suggests, what experience proves, that forest trees ought seldom or never to be pruned, except in branches that decay or wither. Every branch and leaf is a caterer for food, as well as every root and fibre, and the tree is deprived of nourishment by the loss of the one as well as of the other. Pruning is especially hurtful to trees of the coniferous and pyramidal order.

After fixing on the ground for your plantation, the next care is to get it sufficiently fenced. Of what kind that fence shall be, must often depend upon circumstances. In soft or mossy land, at a distance from stone, it must probably be a ditch. When it is, let it be six feet wide, and the face of it planted with cuttings of willow. In the case of having plenty of natural wood, it may perhaps be convenient to fence with palings, such as are often used to preserve natural woods after cutting. But these are neither durable nor afford shelter; and to raise a quickset hedge would be tedious, and the soil would perhaps seldom suit it. A stone dike is certainly the best, if not the only fence to be chosen. Four feet in height, with a cap of stone, will defend a plantation from cows and horses; but a foot more, with a cap of turf, and a little watling wove on the top, will be necessary to defend it from sheep. A few rows of Scotch firs should be planted next the fence, as they are hardy and of quick growth, and will help to shelter the rest of the planting. Or, if there is depth of soil and moisture, the borders may be rather turned up with the spade, and planted with cuttings of Huntingdon willow, which, in four or five years, will rise to the height of giving a good deal of shelter, and prove no unprofitable timber afterwards.

The next consideration is the choice of trees; and in this, as in the choice of ground, you are to be guided chiefly by nature. The kinds planted by her in the country are undoubtedly the best adapted to the soil and climate. If you observe the remains of old trees, such as firs or oaks, in the ground; or if any bushes or trees of useful timber are still offering to grow on it, you may in either case plant such kinds with safety. You may also observe what kinds of trees thrive best in natural woods, on soil and situation similar to your own, and follow the hint which nature gives you. In general, the Scotch fir, the oak, the ash, and the

birch, all which are natives of the country, and seem to thrive on poor soils and high exposures, should be plentifully chosen. The elm too is a native of the county, growing in natural woods, and frequently in gulleys at a great elevation; which shows it to be, like the rest, well adapted to the soil and climate. The alder, or aller, likewise a native, will grow in wet spots, where the rest will not thrive, as will also willows and poplars, which are also natives of the soil, and grow to be large timber.

It is natural to conclude, that where one species of any tree will grow, the other species of the same tree will grow also. Accordingly, in this country, the native soil of the Scotch fir, all other firs, such as the silver, spruce, and larch, have been found to thrive. In like manner, as one species of elm is a native, the other species of the same tree may be supposed to be congenial to it, and may be planted along with it. The beech, the lime, the plane, and the chestnut, though they are not natives, are found to thrive well in our soil and climate, and add much to the majesty, beauty, and variety of any plantation. Most of these trees, when they thrive, will, in from 30 to 50, 60, or 70 years (when they arrive at tolerable maturity), measure as many feet as they number years of growth, and often a great deal more, and will be worth at least 1s. per foot. The oak takes more time to come to maturity; but then, in return, it will ordinarily sell at more than double this price; besides the bark, which is of great value. Of all our trees, this for majesty, beauty, and use, deserves the preference, and ought to be much planted, and carefully cherished.

In a county in which planting has made as yet but little progress, it may be proper to show the mode of raising the different kinds of trees * with a view to facilitate this great

* Such as may wish further information on this subject, may see Dr. Hunter's edition of *Evelyn's Sylva*.

improvement. In order to this, the first thing is to prepare a seed-plot and nursery. The situation of these should be well sheltered from the north and west. The ground should be well trenched, that it may be the easier kept clear of weeds. The soil should be rather poor than rich; as plants raised in rich soil must feel a severe check when transplanted into poorer ground. This premised, we proceed to the

Oak.

Let the acorns be chosen from straight and large thriving trees, when they are ripe and begin to fall in the month of November. Of these, and of other seeds, they are not always the largest, but the most weighty, clean, and bright, which are the best. The most natural time for sowing them is when they fall spontaneously from the tree. But as they are liable to be destroyed by mice and other vermin, some delay sowing them till spring. When this is the case, the acorns may be spread thin on a boarded floor, till sown in February or March. Prepare the seed-beds four feet wide; rake the earth into the alleys, two inches deep, and with a sharp pointed stick draw lines across, four inches asunder. On these lines lay the acorns two inches distant from each other. Press the seeds gently down with the back of the spade, to keep them in their places; then spread the earth over them two inches thick, and gently rake the beds even*. By their being planted in rows four inches asunder, a two-inch hoe can pass between them without injuring the plants, and the weeds are more easily destroyed than by sowing broadcast. In about six weeks the plants will appear. For two years they may remain in the seed-bed, with only the care of keeping them clean in summer, and spreading a little fresh earth and ashes among them in winter. They are then to be

* All seeds should be sown when the ground is moderately dry.

transplanted in October or March, either to the place where they are to remain, or to the nursery. If into the nursery, it must be in rows two and 1-half feet asunder, and one and 1-half distant in the row. Here they must be frequently hoed, and the ground dug between them before winter, till they are planted out for timber. The younger they are planted, if it is on bare ground, where grass will not outgrow and oppress them, the more easily they will accommodate themselves to the ground.

Instead of this method, the acorns (and other seeds of trees) are sometimes sown at first where they are to grow and remain*. This method makes the best timber; the plants suffer no check, nor feel the inconvenience of a change of soil, and the expence of raising an extensive plantation in this manner is very trifling. Besides, it is found that the seeds of trees will grow in situations in which the plants have failed. The most expeditious way of sowing the seed in this manner, is by a party of three men working together. The first with a paring spade takes up a turf, the second stirs the earth with a spade, and the third distributes the seed and covers it. If any of the seedlings fail, they may be replaced by young plants raised on a similar soil, which will soon be reconciled, when very young, to their change of situation. Indeed the oak, when planted from the seed, or at most from the seed-bed, adapts itself wonderfully to almost any soil or situation; though it delights most in that which is dry and gravelly. Such is generally the heathy ground of this county, and it can never be better occupied than in raising this noble tree, so essentially necessary for ship-building and tanning leather. If it is found advantageous to raise this timber in some of the finest counties, and in some of the best lands in England,

* In this way (which is common in England) Mr. Stewart of Grandtully in Perthshire, has raised a considerable oak wood. *Stat. Acc.* Vol. VI. p. 360.

how much more so, on the heathy hills of Argyleshire: Besides, as what we use of this timber at present is brought from England and Wales, the freight is almost half the cost, so that, independent of the gain in point of soil, the Highland landlord would draw 40 or 50 per cent. more for his timber than the man who raises it in England. And yet so inattentive are our landlords to their own interest in this respect, that they generally allow all the oak in their natural woods to be cut in coppice, except a few standards, some of them so injudiciously chosen, that they soon wither and perish *.

The wood of oak, cut in this manner, when only 19 or 20 years old, is of little value, and its quantity of bark is not considerable: whereas, if it were allowed to grow to maturity, a foot of it would sell for as much as two of almost any other timber, and the bark would grow in proportion †. The oak, in its infancy, is of slow growth, and tender, and only beginning to thrive and be hardy when, with us, it is cut down like the rest of the coppice. Were it allowed to stand, it would amply pay for the delay. It is when of size, that the oak, and indeed most trees, begin to pay best for their room ‡.

An oak, in the first 75 years, is calculated to grow one ton of timber, but in the next 75 to produce seven times as much §. And were it allowed to stand for double that time, it would probably increase in a still greater proportion ||.

* They are often tall hoop-like poles, whose girth and branches bear no just proportion to their height; so that, when deprived of shelter, they are unable to resist the storm, and are wind-waved till they perish.

† In quantity; in quality it is allowed to be inferior to that of young wood; and the shoots from old stocks are said to be less vigorous.

‡ The timber on the estate of G. Pitt of Southampton, was valued, in 1659, at 10,300*l*. From that to the year 1677 there was sold of it to the amount of 6,800*l*., and the remainder valued at 21,000*l*. So that, in 18 years, a stock of 10,300*l*. grew, without risk or trouble, to 27,800*l*. Near the same place, 338 young trees were valued at 59*l*.; and 24 years after, valued at 800*l*. *Hunter's Evelyn*, Vol. II. p. 228.

§ *Bath Papers*, Vol. VI. p. 38.

|| An oak felled by the Bishop of Sarum, in 1758, and supposed from its num-

As the advantage of preserving oak timber till it arrive at maturity, is a subject of great importance to the owners in particular, and to the nation in general, it requires and deserves to be illustrated. With this view, the following account of the increase of 6 oaks, in 16 years, is extracted from a table, of which the two first columns were first published in the Philosophical Transactions (Vol. LI.), and afterwards in Agricola's Letters in the Scots Magazine (Vol. XXXIII.), with the additional columns which mark the solid contents and increase.

A TABLE showing the increase of 6 oaks, in 16 years, from actual measurements taken by R. Marsham, first in April 1743, before the growth of that year began; and again in autumn 1758, after that year's growth was complete.

N ^o	Girth in		Height in		Solid Conts. in		Inc. in
	1743	1758	1743	1758	1743	1758	
	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Cubic	Cubic	Cubic
1. Fast thriving, but found,	9 4	10 10	129	630	0 149	3 190	3 41 0
2. About 80 years old,	6 3	7 8	27	0 28	9 67	5 118	0 50 5
3. Planted about 60 years,	5 11	7 2	26	9 28	9 57	1 91	9 34 8
4. Planted by myself in 1720*,	2 11	5 1	18	0 23	6 9	5 37	9 28 4
5. Sowed in 1719,	1 7	2 8	13	0 18	0 2	0 7	9 5 9
6. Planted in 1720 or 1721,	2 9	4 9	18	0 25	0 8	7 35	2 26 5
Total increase in 16 years,							186 7

From this table it appears that six trees increased 186 cubic feet in 16 years; which, if sold at 2s. 6d. per foot, would

ber of circular rings to be 300 years old, contained 1045 cubic feet, besides 74 feet of smaller timber; in all 28 tons, which, at 2s. 6d. per foot, is 200l. *Ibid.* p. 10.

* It appears from the Bath Papers (Vol. VI. p. 49.), that this tree in 1799 (when Mr. Marsham, the planter, was still alive) was eight feet round at fourteen feet from the ground. How encouraging to young planters!

amount to 23l. 5s. Now, if we suppose 160 such trees, small and great, to stand on a Scotch acre at 18 feet distance, the increase, at the same rate, would be 4960 cubic feet; which at 2s. 6d. would amount to 620l. or 38l. 15s. for the annual increase. Or, if you suppose the number fewer, the distance greater, or the price less *, still the profit will be so immense as to show that it is the manifest interest of every one who has oaks to preserve them till they grow to maturity. When we see them young and shooting up in their height, we are more sensible of their growth; yet the real increase is vastly more at a later period, though that increase is so imperceptible, that, without actual measurements at different periods, the eye cannot discern it. It is worth observing (as Agricola remarks), that even Mr. Marlham himself was deceived by N^o 1. in the table, as he imagined it *past thriving*, and yet, in 16 years after, it increased 41 cubic feet; which was paying above 6s. a-year for the room it occupied, without taking the increase of bark into the reckoning. An oak must be old indeed before it is the interest of the owner to cut it down, unless it interferes with the growth of a better. In England, where they know well the advantage of preserving this kind of timber, oaks are allowed to grow till they contain often from 200 to 400 feet of timber, and till some of them are worth 60 guineas each †.

Let us suppose there may be in this county 20,000 acres of good natural wood. Some of it abounds with oak, and

* It is often much higher. Last year some oak was bought by the Crinan Canal Company as high as 7s. per foot.

† "Some oaks contain 700 or 800 feet of solid timber, exclusive of their tops." *Hunter's Evelyn*, l. 96.—Such is the account given, for instance, of Lord Bagot's oaks, for which he has been offered 100,000l. *Agric. Report of Stafford*.—These woods stand on poor cold land; so that a Highland proprietor, of no great estate, might well reckon on rendering a tract of his land one day of equal value, by preserving what oaks he has, and planting others.

some does not : but, at an average, it may be supposed that on every acre, one with another, 20 oak trees have been cut, which might and ought to have been saved. In three cuttings of a wood, each of these oak trees or bushes can hardly be supposed to have produced 3s. which on the whole would amount to 60,000l. : but had they been allowed to stand for 60 years, the time of these three cuttings, each of them at only *one half* the growth of the oak of 60 years in the above table (i. e. half of 57 feet), would be worth, at 2s. 6d. per foot, 3l. 11s. 3d. (besides the bark), which on the whole number would amount to 1,425,000l. From this deduct the above sum, and the interest of its different moieties since the time of their being paid, and still the loss will appear to be far above a million Sterling; and a million too that would be in the way of doubling, tripling, and quadrupling itself, as already shown, in a much shorter period of the time to come. Is it not time then to change our system, and to save our oaks? To cut corn in June would be almost as wise as to cut oak in coppice.

Fir, Larch, &c.

To raise all the coniferous trees, gather the cones in February or March, and in the beginning of April spread them on a seed-bed (prepared as for acorns). In a short time the sun and air will make them drop seed enough for the bed. Then rake off the cones, and sift a slight cover of earth over the seeds. Keep the beds clean in summer. In winter cover them with branches of trees, broom, or heath, to guard them from being spued out by the frost. Next spring the plants may be pricked out to the distance of four inches, and those taken out placed at the same distance in other beds. The second year they may be suffered to stand in these beds. The third year they may be planted out, or removed to the nursery, in lines three feet asunder, and 18 inches distant in

the line; always taking care to keep them clean and hoed till planted out. If the ground is bleak and cold, they should be planted out from the seed-bed. The best season for transplanting all sorts of firs, especially in our cold grounds and moist climate, is about the end of March or beginning of April, before they begin to shoot. They should not be put much deeper in the ground than they were in the seed-bed or nursery. If the plants are large before they are taken out of the nursery, the pits may be dug for them before winter, in order to mellow the soil by the frost. If, instead of this mode, the plantation is to be raised from the seed (as recommended in the case of the native fir), it may either be done by three men, as above directed, or by two men; the one making two cuts with a spade thus >, and raising the angle, while the other puts in the seed, and presses down the sod. In this way two men will plant 1000 in a day. If the ground is stony, a dibble may be used; and if it is moss or clay, which will be ready to shrink with drought, an instrument like a gouge or borer is used to cut a round hole, in which the seed is covered. The seed may be put from one to two inches deep. It will grow in exposed situations, in which plants might fail; and "trees thus raised will in a few years outgrow those that were planted at the same time, and be also taller, straighter, and of a finer bark*."

The common Scotch fir will grow on poor gravelly soil which naturally produces only heath. But though it is thus hardy, and of quick growth, as are also the spruce and silver firs, it is not of great value. All these do well as nurseries to shelter other timber, and to add to the beauty and variety of a plantation; but they will not pay so well for letting them grow to maturity, as most other trees. The larch deserves to be more cultivated. It thrives well on thin, gravelly, or

* *Hunter's Evelyn.*

heathy soil; grows as fast * at least as the Scotch fir, and gives a valuable timber. Its property of burning slowly, and with great difficulty (remarked so long ago as the time of Pliny), makes it the fittest timber for flooring. It is also found to be very durable, either in wet or dry situations †. Of the care that should be taken to propagate our native fir, it is unnecessary to say more than has been said already.

Ash.

The ash serves for the greatest variety of uses of any tree in the forest. It delights in dry land, especially in sandy soil, by the side of rivulets. It grows fast, and to a great size, when allowed. One at Campbelton measures above 12 feet in circumference. To raise the ash, procure keys from young thriving trees in October or November. Prepare the seed-beds as directed for acorns. Rake about one inch off the beds into the alleys. Sow the keys (in November) moderately thick; then throw, or sift, about one inch of earth over them. In spring take away moss and weeds gently, and sift a little earth over them again. Weed the beds when they need it. Next spring (in February) rake off gently any moss, &c. sift half an inch more earth over them, and in March or April the young plants will appear. During summer weed them; in October sift some ashes over them, and a little earth, if rains have laid the roots bare. Next spring remove them to beds, a foot asunder. After two years remove them to their nursery, three feet asunder in the drills, and one in the lines, where they are to be hoed and kept clean till planted out.

* A larch at Blair-Drummond grew, in 57 years, to 134 feet of good timber. *Stat. Acc.* VI. 504.

† The city of Venice is said to be built on piles of this wood, which are still not only fresh, but grown so hard as to resist the edge of a tool. *Satr. Mag.* Vol. XXXIII. It is said also that the larch resists the worm.

The Plane is raised in the same manner as the ash ; but it comes up the first spring.

Elm.

This tree yields useful timber, and grows to a great size ; and therefore deserves to be cultivated. The broad-leaved, or Scotch elm, (called by some the Wych elm) is a native of the Highlands, but seldom allowed to grow large, as it is often deprived of its bark, from a notion that it is a cure for burnings. A Scotch elm at Inveraray measures 28 feet in the stem, and 10 feet in circumference ; and an English one measures in circumference eight. These show how well the two kinds will grow with us. The Wych elm, however, is the most noted for its rapid growth. A tree of this kind has been known to grow, in 30 years, to 60 feet of timber, which sold at 1s. the foot *.

The Wych elm is sometimes raised from the seed, gathered, when ripe, in summer, and allowed to dry for a few days before it is sown, as otherwise it might rot. The beds are covered with mats, to screen them from the sun, till September ; sprinkled over with ashes in winter ; kept clean after they come up in spring and summer ; and in the spring thereafter removed from the seed-bed to the nursery, three feet asunder in the drills, and one 1-half in the lines. But the more common and easy way of propagating elms is by layers, procured by earthing up mould about the shoots of stocks that were cut. This is done in spring ; and, by the autumn following, the layers will have taken root, when they may be removed from the stool, and put into the nursery, as above.

Beech.

This tree “ delights in stony ground, and will thrive in

* *Agricul. Rep. of S. afford.*

" soils and situations where few other trees will grow *." Its timber is good, and it grows fast. A beech at the age of 60 was calculated to contain 100 feet of timber, and to contain 212 in 24 years after; that is, more in the 24 last years than in the 60 preceding. " May this prove an inducement to those who have thriving trees to preserve them till they have done growing †."

To raise this tree, gather a sufficient quantity of mast, when it falls in September. Spread it on a mat to dry for five or six days; and, after that, you may either sow it, or keep it till spring. Sow as acorns. Some will come up that spring; some only the next. After two years remove them to the nursery, where they are to be treated as young oaks.

Lime.

This is a beautiful tree, but the timber is not very valuable. It grows any where, but incredibly on rich soil. It may be propagated by layers (as the elm) or from the seeds, which are ripe in October. After drying them for a few days, they may be sown; covered one inch deep, and afterwards treated as any of the plants above.

Birch.

This tree grows in any soil or situation. Its timber is useful to the farmer and turner, and its bark is useful in tanning leather. It is propagated from layers; or from the seed, sown in autumn, kept clean the first summer, and the following spring put into the nursery till of a size for planting. A great deal of old birch has been destroyed in some parts of this county, by the barbarous practice of stripping the trees of their bark while standing, for the purpose of tanning leather.

* Hunter.

† Bath Papers, Vol. VI. p. 30.

Alder or Aller.

This delights in watery or boggy places, where it thrives well. But the timber, though it takes a fine polish, and is sometimes used for tables, is not very valuable, as it is not lasting. Its bark is used in the Highlands for dyeing black, and sold in some parts of England at one penny per pound for the same purpose *. It may be propagated from the seed, like the birch; but we have abundance of it without being at that trouble.

Poplar.

Of the poplar there are different species, all of which grow well with us, and at least some of them are natives. At Ardmady in Lorn, there are some old poplars of a vast size. The most valuable species is the abele, or white poplar. It is said to have the same property with the larch, of burning slowly and with difficulty. Another valuable property is ascribed to it, that of resisting the ravages of the worm †. It delights in watery, but grows well in dry soils. It grows so rapidly, that in 12 years it has been found to measure 30 feet in height, and one 1-half in girth; and at the age of 50, some trees of it were found to contain two tons of timber ‡. It throws up suckers from its roots in every direction; which may easily be transplanted. Or, like all the tribe of poplars, it may be propagated by cuttings. Spring is the best season for this; and vigorous shoots of last year, or at most of the preceding, should be chosen. They should be 18 inches long, planted in the nursery three feet asunder in the drills, and one 1-half in the row, and one foot in the ground. In two years they may be planted out.

* *Lancashire Report.*

† Bath Papers, Vol. VI. p. 23.

‡ *Ibid.*

Willow.

Willows of all kinds may be propagated in the same manner, from cuttings two years old, though the bottom of one year's growth will do. But these may be generally placed where they are meant to grow, without going through the nursery. The Huntingdon willow grows fast, and to a large size. We have some trees of it from two to three feet in diameter.

The hoop willow * should be raised in great quantities for the use of farms, but especially of fisheries. It will grow well in mossy ground previously occupied by potatoes in the lazy-bed way. The cuttings should be planted three feet asunder in the drills, and one 1-half in the rows. "When they thrive well, the shoots are in three years ready for the market, and frequently sell at 24l. an acre †." It is astonishing that in the neighbourhood of such a fishing town as Campbelton, which needs such quantities of hoops, which at present are both dear and distant, more attention is not paid to this article. A farmer even upon a short lease could never turn an acre of even good land to better account than by planting it with willows; a liberty which no landlord would refuse.

Thorn for Hedges.

The white or hedge-thorn grows in all our woods, and

* The writer of this having frequent occasion to travel many years ago through the wood of Lettir, on Lochow side, never failed to be struck with the luxuriance and large annual shoots of a bush of an uncommon kind of willow (on the lower edge of the road, a little south of *Deers-leann water*). It has a broad leaf, and a shining brownish bark; and promises to be a valuable species of the hoop-willow.

† *Agricultural Report of Ayrshire*.—The crop of one 1-half acre in the neighbourhood of Greenock was sold a few years ago for 50l.

affords an easy opportunity of raising it for fences. The seed, as soon as gathered in October, should be buried in a dry trench, about a foot thick; where it is to remain two winters, and one summer. In the second spring, when the seeds will begin to sprout, they should be sown in beds, and kept free of weeds, till removed to the nursery next year; when some of them may be of a size for planting out. The holly may be raised in the same manner, for hedge, ornament, or use *. Or, it may be raised from layers in a more easy and expeditious manner.

Having made choice of the kinds of trees which you mean to plant, you may, in some measure, use your fancy in mixing and proportioning the different kinds. The only necessary thing to be attended to in this case is, to mix the better and worse kinds, so as that the former may stand at a due distance when the latter are removed to give them room. Thus, the firs should be so mixed with the oaks as to shelter them when young; and when they have sufficiently answered that purpose, removed by degrees, to give room to the oaks as they come to need it. In a Scotch acre may be planted 2000 deciduous trees †, or 3000 Scotch firs and larches, at the

* It deserves to be inquired, whether the raising of plants from such seeds as are thus enclosed in a pulp, and require a long time to vegetate, may not be greatly facilitated by some artificial process? It is well known that the seeds of many trees vegetate the more quickly if they have passed through the stomachs of birds. Thus the seed of the mountain-ash, which they drop with its dung about it, grows on bare rocks and on the tops of hills, where the art of man could not probably raise it: and the solitary thorns on our mountains have probably sprung up in the same manner. Might not this operation of nature suggest some mode of producing the like effect by means of lime, horse-dung, &c. in a hot-bed? The kind of manure, degree of heat, and length of time, necessary to effect this process of maceration and fermentation, might perhaps be nearly conjectured beforehand, and ascertained with precision by a few experiments.

† Of these near one-half should be oak, where the ground suits it. As the great object of the planter should be to raise this tree, it is proper to plant it

distance of a yard, or a trifle more, asunder. It is proper to plant them thus thick, that they may shelter one another when young. When they grow to be too thick, they may be easily thinned; but an error on the other side is not so easily corrected.

In order to let all who choose have plants easily, nursery-men should be settled and encouraged in every district of the county. The pleasure of planting trees, where they are scarce, is so great, that even poor farmers and cottagers, would often shelter or adorn their little gardens with trees*, if they got them cheaply and conveniently. Till this is the case, such as are disposed may, with little trouble or expence, raise plants for themselves, from such seeds as they can find, in the manner above described.

Proprietors should not only exert themselves in raising plantations, but give every encouragement to their tenants to do the like. If, at their removal, they were to be paid a half or third of the value of what timber they had raised, according to the length of their lease, it might have a good effect†. But the unskilfulness of some, and the carelessness of others, will make every plan of this kind always precarious; and the business is of too much importance to the landlord to have much of it left on such an issue. Even if the tenants should do the work to purpose, it is the landlord who pays

in large numbers, in order to have an opportunity of making a good selection of such as are to remain for timber. These should ultimately stand about 30 feet asunder; the intermediate trees being gradually removed, as those which are to stand may require.

* The Duke of Argyle has furnished many of his tenants in Kintyre with trees for this purpose; and the effect is such as to encourage an extension of the plan. There are besides, in every farm, banks of ditches, and margins of brooks, which, if planted, might soon furnish timber for the farm.

† Mr Dempster of Dunichen raises a good deal of timber in this way, which makes the tenants interest themselves in rearing it. *Stat. Acc.* Vol. I.

for it, and that probably as dearly, though not so perceptibly as if he did it immediately himself. In all events, therefore, it is best that, at least for the most part, he should employ proper persons, at his own immediate charges, to plant and preserve his timber. The importance of the object calls upon him to do it in the speediest and most effectual manner, and the profits will, in a short time, amply repay him for all his expence and trouble.

The sum of what has been said on this subject is, that the soil and climate of this county are well adapted for raising timber, as both dead and living trees abundantly testify: That thousands of acres in every parish, at present of little value, are capable of this improvement and of no other: That the worst land, by this management, may be made to yield more profit than perhaps the best arable land in the kingdom on any other plan: That this improvement beautifies the country, benefits the nation, gives employment to the poor, creates work, and a fund of opulence for posterity, and, in the meanwhile, yields a rational pleasure to the planter, with the near prospect of large profits to himself, and a sure fortune to his family. This last consideration is peculiarly weighty. In this country, where riches do not abound, the younger children of families are sometimes but poorly provided. A few acres of waste land might, at a small expence, be converted into an ample provision for each of them. "I have read of
 " a certain nobleman (says Evelyn), who, after his lady was
 " brought to bed of a daughter (considering that wood and
 " timber was a revenue coming on while the owners were
 " asleep), commanded his servants immediately to plant in his
 " lands, which were ample, oaks, ashes, and other profitable
 " and marketable trees, to the number of 100,000; as un-
 " avoidably calculating, that each of those trees would be
 " worth 20d. before his daughter became marriageable, which
 " would amount to near 10,000l.; and this he intended to be

"given with his daughter for a portion." Happily the principal nobleman concerned in this county needs no such example to be set before him. But to every other proprietor concerned in it, we would wish to say respectfully, but earnestly, *Go thou and do likewise.*

CHAPTER XI.

OF WASTE LANDS.

In this county there is a vast quantity of waste land which is capable of cultivation. Much of this land, if improved, would be of more value than a great part of what we have now in tillage. Our forefathers, ignorant of the art or advantage of draining, pitched not upon the best, but upon the driest fields. If the plain was too wet to admit the plough they passed by it, and tore up the face of the bleak and barren hill, where there was neither soil nor shelter. Hence a great deal of our best soil still remains in a state of nature.

The quantity of waste land capable of cultivation, that may be in the continental part of this county, may probably, at a low calculation, be stated on an average at 2000 acres to each parish, or about 50,000 in all *. What a vast source of riches to landlords, of employment to the poor, and of benefit to the public, is here, if duly attended to ! What wretched policy was it to drive such numbers of our people to cultivate the wilds of America, when we had such extensive wastes to be improved at home ? Nor is it much wiser to make them migrate to manufacturing towns and large cities, which is their only resource at present. There, indeed, they are not lost to the state, but they are lost to the country ; and a very

* This may be far under the mark. In the county of Radnor (30 miles by 25), which is little more than a third of the extent of the continent of Argyleshire, it is computed that there are 50,000 acres of waste ground capable of being cultivated, and of giving food and employment to 10,000 people (*Agricul. Rep.*). Calculating at this rate, which we might fairly do, as this county is less improved than that of Radnor, what a vast accession to our numbers, both of men and cattle, and consequently to our wealth and power, would arise from the cultivation of our waste grounds !

serious loss it is. Besides, neither their own health, nor morals, nor the general interest of the state, is promoted by their being employed in any other line, so much as by their being employed in agriculture. Had landlords, by some liberal plan, encouraged them for 30 or 40 years past, to improve those waste lands, thousands of acres not worth 1s. now, might have been worth 15s. or 20s.; the food, and consequently the number of men and beasts, might have been greatly increased, and the value of estates greatly raised above what it is at present.

The Highlanders, secluded from the rest of the world, by customs, manners, dress and language, are so strongly attached to their country, that they would seldom roam for bread if they could get it at home. If this were not the case, one half of those who remain had been away ere now. Should not landlords then avail themselves of this attachment of their people to the soil, and promote their own interest and that of the public, in the most essential manner, by encouraging population, and the improvement of waste lands?

As there is reason to believe that many landlords do not advert to the gain of improving waste lands, it may be proper to state it, and to show that in no other way can money be laid out to such advantage. Whenever it is laid out with judgment (as it always may), the risk is less, and the gain greater than in manufacture or in commerce. When the manufacturer or the merchant disposes of his goods at six or twelve months credit, he risks the stock altogether, and his gain, when he gets it, is generally but 10 *per cent.* : Whereas the improver of land is, in the first place, free of all hazard; and, in the next place, may be supposed, in general, to gain at least from 12 to 20 *per cent.* upon his outlays.

The average expence of draining or improving waste ground is commonly estimated to be under 3l. per acre *. Now, if

* In the *Account of the most Improved Method of Draining* (p. 164.), it is said,

by these 3l. land worth only from 1s. to 3s. is raised to 15s. or 20s. the improver has, at the lowest rate, 12 *per cent.* for his money. Or, in other words, by laying out 3l. he adds 15l. to his stock, as every shilling *per annum* which the acre is improved, is worth at least 25 years purchase.

Enclosing and manuring are not reckoned, as lands already in tillage need these meliorations as well as those that are yet uncultivated *. The only expence peculiar to the improvement of waste lands is that of draining and reducing the surface to an arable state; and this, it is believed, was stated fully high, as the value of the improvement is probably stated too low. At least this is generally estimated higher wherever it has taken place, as might be shown in numberless instances throughout the kingdom †. The few instances of such improvement with ourselves may serve sufficiently to

"The under-draining one acre (the drains at one rood apart), including wood, straw, and all other incidental charges, amounts to an expence of from 40s. to 45s. an acre."

* In improving waste lands, the open drains or ditches may also be made to serve for fences; so that the expence of enclosing may be saved. The converting of waste lands, whether into tillage, plantations, or meadows, must depend on their peculiar circumstances. But, in portioning out the land, the conveniency of draining and watering should be considered in the first planning of it, as this will save future expence and trouble. Few instances will occur in which the ditches for the necessary fences may not be made useful drains, and often the only ones necessary; and there can be few large tracts allotted for meadows or pasture, of which at least a part may not admit of being watered.

† Mr Mackenzie of Allangrange has improved 70 or 80 acres of a perfect morass, which let for less than 1s. the acre, so as to be worth now from 15s. to 20s. *Stat. Acc.* XII. 268.

A spirited farmer, who, not many years ago, took in lease a tract of 1400 acres of waste ground, says, that some of the worst of these acres are now very cheap at 40s. each in pasture; that 100 of them are worth more than the whole farm when he took it; and that, though formerly covered with heath, and in a high and unsheltered situation, the parts improved were brought, in one or two years, at a moderate expence, to produce as abundant pastures as any near the banks of the Clyde. *Append. to Agric. Rep. of North. Count.* p. 2. and 12.

show, that what could not feed a sheep may be made to feed a cow; and the expence is allowed to have been moderate, although the improvers have not been at pains to ascertain it, as such things are done by servants or labourers occasionally, and not by the piece.

It is often said that the soil and climate of this county are more adapted for producing grafs than corn. The truth is, the soil and climate of the greater part of it are well adapted for either; and wherever toil and skill are exerted in raising either, they are sure of being well rewarded. But, supposing grafs should be our great object, ought we not then to put more of our land in a capacity of raising it? Our meadows are bad, but we may mend them; they are few, but we may add to them; and, almost to any degree we please, create both pasture for the summer, and provender for the winter. By such improvement of our waste lands, and by the introduction of green crops, it is possible enough that, in half a century, some parts of this county might rear more than double the black cattle or sheep that are reared at present. In last century the Isle of Anglesey (not a third larger than the district of Kintyre) was only beginning to be improved, as we are now, and its annual export of black cattle was but about 3000. But such was the progress of its improvement, that before the middle of this century its exports rose to 15,000 cattle (and other articles in proportion), reserving still a stock of 30,000 at home*. It is impossible to say what our quantity of waste land, if improved, might one day be made to produce. It is certain that much of it would be found to be more productive than a great part of what is in tillage at present.

Profitable, however, as this business would certainly turn

* *Campbell's Polit. Survey*. I. 498. Since that period (little more than 20 years), the stock is increased to 40,000. *Agr. Rep.*

out, both to the individual and to the public, it is to be regretted, that they who are able are not often disposed to attempt it. Instead of this, they choose to buy more, and to enlarge their quantity of wilderness, rather than to improve what they already have. If they would duly weigh these two plans, they would probably make a different choice *. To improve one acre of waste ground, may perhaps cost as much as would buy two in the same state: but then it will afterwards yield the rent of six: and a compact estate is more desirable than a larger one that is but equally productive. It is more; for the saving of seed, labour, and fencing, may render one acre that is worth 10s. a more profitable concern than three that may be worth 5s. each. Land cannot be bought under 25 or 30 years purchase; while the profit on improving it may be generally obtained for less than a fifth of this price, and give a revenue equally certain; and a revenue too which is not, like the purchase of land, subject to any taxes †.

* It is indeed a common observation in this county, that proprietors seldom make much of farming or improving land. If the remark has any foundation, the reason of it may be, that proprietors must do many things at a greater expence than ordinary farmers, as advantage is often taken of their inexperience, and they cannot so narrowly look after their servants: and, if they want skill, or will not give attention, they would as little succeed in any other business as in this. The fault is in them, and not in the subject.

† The following extract from the *Agricultural Report of Montgomeryshire* (in North Wales) will show, that the advantage of improving waste lands is much greater than is here stated.

“ Mr. Corbet now draws 50 per cent. per annum for the money laid out in improving his mossy or turbary lands; which is the same as buying an estate at two years purchase. The soil is generally of a mossy nature. The main drains are very deep and wide, and constitute a part of the fence, The smaller, or covered drains, are four feet deep, and two wide at top, sloping to three inches at bottom. The turf inverted, is laid eight or nine inches from the bottom, leaving a vacancy for the water. Within these

In every view, therefore, the improvement of waste lands is a gainful business to the owner. It is found to be so even in England, though the improvement upon an acre of land is often taxed with from 5s. to 10s. 2-year of tithes and poor rates. This, of itself, would be no small gain; but we have it over and above that of our neighbours. It is evident, therefore, that he who is able should lose no time in improving his waste lands; and that he who cannot do it otherwise, would find it his interest rather to sell the one half, in order to improve the other, than that the work should be left undone. When a proprietor is not disposed to improve his waste grounds himself, he ought to give the most liberal encouragement to tenants and labouring poor to do it for him. What this encouragement should be, must depend so much on the varying circumstances of soil, situation, even-

" twelve years, Mr. Corbet has thus improved 261 acres, the average rent of	
" which was formerly only 9d. per acre,	L. 9 15 9
" Present value 144 1-half acres at 30s. per acre, and 116 1-half	
" at 40s. per acre,	450 2 6
" Additional rent gained,	L. 440 6 9

Expence of the Improvement.

" Embanking 1980 yards, at 2s. 6d. and 2310 yards,	
" at 1s. 3d.	L. 418 17 6
" Draining 12,452 yards, at 7½d.	389 2 6
" Sundry other improvements,	40 6 3
	L. 821 6 3

" Mr. Corbet has still a great quantity of waste land to improve, which can be done at a still smaller expence, as no embankment is necessary. The peat, or mossy land, by frequent ploughing, application of lime, and flooding, is now almost converted to a rich loam. I should think it worth almost double the highest value put upon it, as it is flooded. He pastures it till the beginning of June, and cuts hay the beginning of August."

It is obvious, that the greater part of the above expence arises from the embanking, for which there will rarely be any occasion. Were it not for this, the profit which, as it is, exceeds 50, would be above 100 *per cent. per annum.*

ness of surface, depth, declivity, and access to natural manure, as lime, water, sea-ware, &c. that no general rule will apply to all cases. Every proprietor might employ some skilful and judicious person to ascertain the value and extent of his waste improveable lands, and to draw regular plans and estimates of the proposed improvement; after which he could judge of the terms on which they should be given to be cultivated. The foundation of the encouragement, however, ought certainly to be a long lease to poor, honest, and industrious labourers; with a small matter to build a house, and to help them to live till they can raise food to support themselves; after which they should pay interest for the money, and a small rent for the ground. Proprietors should give any encouragement, short of their own loss, rather than allow these lands to lie any longer as they are*.

The lands capable of cultivation in this county, are of various kinds; some of which will infer more, and some less expence to improve them. There is, *first*, A great deal of

* The encouragement given to a colony of 126 Highland families, who have set themselves down on the great moor of Kincaidine and Flanders (near Stirling), is commonly 36 years lease, 3l. or 4l. to build a house, and no rent exacted for the first seven years. After that, a small rent (a merk Scotch per acre) is laid on, and gradually raised. In the latter end of the lease 2s. 6d. rent is exacted for every acre taken, and not improved, though not worth 3d. This is intended as a spur to diligence. But the more liberal and wiser proprietors, instead of imposing this penalty, give a premium for every acre that is improved (greater or less in proportion to the expence incurred), and add the interest of the premium to the rent. This gives the tenant strength and spirit to go on; while the proprietor has immediately 5 per cent. for his money, and the prospect of perhaps 10 or 15 for it, at the end of the lease, when the improvement is all his own. See *Stat. Acc.* Vol. VI. 496.

If landlords were to pay their tenants one half the estimated value of any improvements they made in bringing in and enclosing waste or mossy land, at the end of a 19 years lease, it would probably conduce much to the improvement of the country. By this means the tenant, who would improve in the early part of his lease, would be more than reimbursed, and the landlord would be 50 per cent. a gainer.

moorish land, covered sometimes with heath, and sometimes with benty grafs and sprots. As this kind of land has commonly a good descent, and rests upon gravel, at no great distance from the surface, which is generally a black peat earth, it may be cultivated with the plough, at no great expence. It should first be ploughed in summer, in narrow ridges; and soon after either cros-ploughed, or well broken with spades. It should then be covered with lime*, or some other manure, receive a gentle harrowing, and lie in that state till it get the seed-furrow in spring. The summer's drought, the winter's frost, and the fermentation caused by the manure, will, in most cases, make it mellow and manageable enough by that time. If, in any case, it should not, it is best to let it have another summer ploughing, and to let it lie till next year, when the crop will be so much the better as to pay for the delay. After the ground is sowed and harrowed, the plough should be run lightly through all the furrows, in order to carry off superfluous moisture, and keep the ridges dry. With the second crop, it should be laid down with grasses for pasture, and the furrows well cleaned. If the ground be of a good staple, three crops may be taken, provided the middle one be turnips, with dung†. This, after the lime given to the first crop, will leave the land in better heart, than if only two white crops were taken, with the lime only.

The improvement of lands of the above description is so cheap a purchase, that even tenants upon a 19 years lease, having access to lime, might pursue it to great advantage. A few of them do so, and more it is hoped will follow their

* Lime is peculiarly suited to heathy, mossy, and new land; as, by its caustic quality, it converts these and other vegetable substances into fine mould. The effect of lime upon new land is much greater than upon old.

† Thus Mr. Barclay of Ury has improved 300 acres of barren land. *Stat. Acc.* Vol. XII. 599.

example. Some of the Duke of Argyle's tenants, in the parish of Southend, have of late years done much in this way, by which their farms and their profits are enlarged, and the face of the country beautified. But the greatest improvement of this kind, that has yet taken place in the county, was by the late Sheriff Campbell of Stonefield, who rescued, mostly from the barren heath, a large farm of many hundred acres; which now of itself would be no small estate. And yet it may be said this vast improvement cost him nothing; for he used to tell that the work always defrayed its own expence. He had, besides, the pleasure of giving employment to a number of labouring poor, and of doing much good to all around him, by furnishing them with seed corn; which is found to answer best when taken from new lands; a consideration which ought to recommend the improvement.

A *second* kind of land capable of cultivation, and of which we have a great deal, is soft bog, or morafs. This is more difficult to improve than moor; but then it will better pay for the expence. It is a collection of rich mud and sediment, washed from the higher grounds, and now mixed with so much stagnant water, that neither man nor beast can tread on it with safety. This kind of soil when well drained, is the richest of any. Nor is the draining of it so difficult as may be at first apprehended. Sometimes the water which poisons it comes from higher grounds, so that it can easily be intercepted, and afterwards made to serve it, in the way of irrigation, as an excellent manure. Sometimes the water is supplied by springs within itself; which will easily be discovered, after the bog has got an outlet at the lower side, to which the springs may be conducted by open drains, as the mud subsides; after which it may be regularly drained, and converted into valuable pasture or arable land, as the owner chooses. A considerable tract of ground in the neighbour-

hood of Campbelton, partly a lake and partly a morass, was thus brought to be excellent arable land by the late Colonel Charles Campbell. Besides the advantage to the owner, the draining of such marshy grounds conduces to the healthiness of the neighbourhood, by removing their putrid exhalations.

A *third* kind of waste ground, and that in which we most abound, is moss; of which there are in every parish large tracts, useless in their present state, but capable of cultivation. They are of different depths, from two or three to eight or ten feet, and of different dimensions; so that some of them may be reckoned, not by the number of acres, but of square miles which they contain. One of these immense mosses lies in the neighbourhood of Campbelton, to which it must some time or other be of infinite service. At present its thousands of acres are almost good for nothing, except furnishing a few peats; which (as is the case in most mosses) have been so irregularly cut, as to add much to the difficulty of improving it. Still however it may, and soon ought to be improved. It has every advantage from its situation; near manure, and near market. Mountains of limestone lie near it on one side, and mountains of sand and sea-ware on the other. A large water runs through the middle of it. Master-drains, or large ditches, at such distances as to serve also for enclosures and divisions of fields, might be made to fall into this water; and lesser lateral drains or ditches might be conducted to those larger ones. The water, by deepening a few fords, might perhaps be made to run two or three feet lower than its present level, which would greatly facilitate the draining. As the water runs on a bed of sand, or gravel, it is probable that the moss is nowhere deeper than the level of this stratum; so that the master-drains could easily be made to reach the gravel, and give vent to the under-water in every quarter. The lesser drains or ditches might also be bored or tapped to that depth, at

small distances, and the weight of the moss would soon press up the superfluous water, and force it to take its departure. As for the extraneous water from the higher grounds, it could not only be kept off by a ditch (which would serve also for an enclosure), but made subservient to the valuable use of watering and manuring the moss, how soon it would be in condition to receive it.

Wherever clay, sand, or gravel, may be found within two or three feet of the surface, a coat of it ought to be thrown over the moss, as it will greatly improve it. This may be easily done, by forming the ground into the shape of broad ridges, and throwing first the mossy stratum of the furrow-ditch to fill up hollows on either side; and then, after the surface is levelled, the clay or sand over all*. When these ditches or square drains stand open for two or three years, it is probable the ground will be so far dried as to allow them to be nearly filled up, by slanting down their edges; if not, they may, where necessary, be easily formed into hollow drains. In the first instance, it is probable the moss, if not all of the ground, must be dressed with the spade, as it may be too soft to bear the plough, as well as in need of levelling. But the difference is not considerable where labourers may easily be got, as here, in the intervals between the fishing seasons. After the ground is levelled and dug, and has had some time to dry, it should be well limed; after which it

* "One method of reclaiming the moss (in Kincardine) is to dig ditches, or *gauts*, as they are called, at such distances, and of such depths, that the clay dug from them is sufficient to cover the intermediate spaces of moss to the depth desired. This makes the most substantial improvement, especially if any considerable quantity of clay was raised; as, in that case, it formed a new soil, which, compressing the moss by its weight, its sponginess produced no bad effect. Moss improved in this manner, after producing some crops of grain, has continued for 40 years to be good pasturage." *Stat. Acc. (of Kincardine)*, VI. 494.

cannot fail of giving two good crops. Grasses should be sown with the second crop; and no cattle, except sheep, should for a year or two be allowed to tread it. These sheep, feeding on one part, might by folding be made to manure and improve another, till all should be brought in at no great expence. The straw too raised on one acre would create dung for another; so that the work wants only a beginning, which it is hoped some of the proprietors or some spirited farmers will soon give it. A small farmer on the Duke of Argyle's property, bordering on this moss, has already made several little purchases from the skirts of it, by which he has made his own circumstances easy, and given proof to others that they may do the like, and have larger profits, by working on a larger scale.

No part of the improvement here proposed is very difficult, much less impracticable. Similar undertakings have been executed to advantage in many places, and are just now going on in others with every prospect of success and profit. Not long ago, a moss in the Isle of Man, six miles long, three broad, and from 10 to 20 feet deep, was drained and improved, and is now the most profitable land in the island *. In the neighbourhood of Paisley, of Carnwath, and of Stirling, the like great improvements are rapidly going forward.

From what improvements have been made in this same county, on moss or peat-bog, by the Duke of Argyle, and several other proprietors, near their houses, it may be seen that this species of ground, though useless in its present state, may yet be turned to great account. There is reason to hope that the advantage of improving it is now beginning to be more generally attended to. The proprietor of the great moss of Crinan (Mr. Malcom) proposes to begin immediately to improve it; and there is no doubt of his doing it with

* *Political Survey of Great Britain*, I. 535.

ease, and to great advantage *. Such a subject is capable of being made of itself a great estate. Many such are in the county, especially in the upper parts of it, and some of them of still greater extent. A sheet of moss on only one farm there is computed to be no less than 10 or 12 miles square. One can hardly indulge the hope that such a subject, and so situated, will ever be improved. But surely in the highest habitable situations in the county, some portion at least of this kind of ground might be profitably cultivated. There arable and meadow lands are scarce. Moss might be made to supply the deficiency, and yield, what is much wanted, a sufficient quantity of hay. Even with a view to pasture, one acre might thus be made to produce more than 20 or 30 in their natural state. The situation does not forbid such improvement. It is believed that no habitation in this county is much higher than the Lead-hills, and yet there, one acre of waste ground, originally not worth one shilling, has been brought to feed two cows. "This shows what culture will effect, even in a wilderness †."

The great obstacle to improvements of this kind in the upper part of the county is, that the land is generally under the sheep system, and in too few hands. A man who holds a tract of many miles will never improve many acres. If the land were in more hands, and, partly at least, stocked with a breed of sheep that could bear to be folded, in order to manure it, much agricultural improvement might reasonably be expected, now when the spirit and knowledge of it is so much diffused. One argument, however, should weigh much with our storemasters, and induce them to improve some part of their waste grounds; and that is, that the *braxy*, a disease so fatal to their flocks, may be effectually prevented, by having

* This improvement is since begun, and considerably advanced.

† *Stat. Acc.* IV. 511.

a plentiful supply of soft artificial grasses for their hogs soon after they are weaned*.

Mossy land is best adapted to the raising of grass; and for that purpose, more than for raising corn, ought it to be improved. Clover will grow in it, if it is sufficiently dry; and ryegrass better, as it is less delicate. But the kind of grass that suits it best is the meadow soft grass † (*holcus lanatus*). This grows close and quickly, keeps the ground well, and is equally fit for pasture or for hay.

In most of the farms occupied by small tenants and cottagers, considerable parcels of new and mossy ground is brought into cultivation, by planting potatoes in the lazy-bed way. Wherever dung can be easily applied to such land, this is certainly the easiest and cheapest way of improving it. But by their usual mode of managing, the principal benefit that should be derived from this improvement is lost, and the ground left in a worse state than it was before. Two, if not three crops of oats are taken after the potatoes, and then the ground is left to nature, to make what she likes of it. Instead of this, the ground, before it is broke up, ought first to be sufficiently enclosed; generally by a ditch, which would keep off foreign water, and help to drain it of its own. Whether this should be done by the tenants or landlord, or both, must depend on circumstances. As soon as the potatoes are dug, every two ridges (or every three, if the lazy-beds are narrow, and the ground pretty dry) should be made into one. This is easily done, by slanting off the outer edges of the intended ridge, and throwing back the stuff into the intermediate furrow or furrows, taking care that the new ridge be sufficiently raised in the middle, to let the water fall off into the furrow that is left, which ought to be well cleaned, and,

* See Chap. XIII. Sect. 2.

† Called by some Yorkshire hay-feed.

if necessary, deepened. In this state it should lie till the beginning of April, when it should be stirred a little with the spade, and sown with oats and soft grafs seed. A second crop of oats may be taken; but the grafs, by getting the ground in better heart, if it be sufficiently reduced and pulverized, will more than make up for the want of it. Next year the grafs should have a slight top-dressing of lime, if none was harrowed in with the crop the year before; or, if that is not convenient, the ashes of the peats burnt in the house might be kept dry in a small shade, and used in place of it. No cattle heavier than sheep should be allowed to pasture the ground for a few years, till the sward is sufficiently strong to bear them. By this management the improvement would be great and permanent: for, though mofs will bear the same rotation of cropping with other lands, yet it will make a better return by putting it early and in good heart under grafs. Corn upon mofs lands is apt to lodge, which would prevent its filling, and make it less fit for meal than for seed*.

* The following mode of improving mofs is extracted from an *Account of the Improvement of Mofs*, by Mr. Smith of Swinrig-muir, Ayrshire, lately published (1797).

The first thing done, is to cut main, or master-drains, so as to serve also for enclosures, or divisions of fields. These are eight feet wide at top, two 1-half at bottom, and four 1-half deep. They cost 1s. the fall of 18 1-half feet running measure.

The ridges are then formed six or seven yards broad. A space of about 20 inches is left in the centre of each ridge, and covered with the turf cut from either side with the spade, in the same manner as if done with the plough. You then proceed to turn up either side with the spade, till you come to the division-furrow, which should be two feet wide, and cleared out on the sides of the ridges, so as to serve as so many lesser drains for conducting the water to the main drains.

The forming of the ridges in this manner, with a gentle declivity to the furrows or open drains on each side of them, costs from 1l. 13s. 4d. to 2l. 2s. per acre.

While we have so much waste ground that may be gained at an easier rate, it is hardly necessary to observe, that a considerable quantity might be recovered from the sea at the head of many of our bays. A work of this kind was begun many years ago at Ardmucniff Bay; but a great storm having demolished the dike before it was far enough advanced to encounter it, the undertaker was discouraged, and the project was abandoned. An estimate of the expence of recovering

The ridges are then top-dressed with lime (carried in wheel-barrow upon planks from the end of the ridges), at the rate of from 32 to 64 bolls of shell-lime to the acre, each boll being five Winchester bushels. The moss should be thus prepared the summer before the first crop is taken. The crop that answers best for the first is potatoes, planted in lazy-beds across the ridges; allowing them a small quantity of dung, about 18 carts to the acre.

After the potatoes are dug, the ridges are brought to the same form as before, by clearing the division-furrows, and sliding down the edges of the lazy-beds, so as not to bury the manured surface. This is done at 18s. per acre. Next spring, early oats are sown, and harrowed in with a light harrow drawn by two men, who will harrow one 1-fourth acre in a day. To prepare for a second crop of oats, the ridges are dug across, and the division-furrows cleared out; which costs from 1l. to 1l. 6s. per acre. Two or three more crops of oats are sometimes taken (which is not considered as the best management) and ryegrass, or soft grass sown with the last for hay.

Such is the effect of lime in consolidating moss, when drained to a proper temperature of moisture, that often after the second, and always after the third year, the ground can be ploughed with horses within two bouts of the division-furrows.

The potato crop does more than pay the expence, and the pasture, when laid down in grass, is estimated at 1l. 5s. per acre. The *Account* mentions a farmer who had improved five acres of moss when only four years of his lease were to run, and intended to improve five more the next year, when only three were to run, without any hopes of its being renewed. A sure proof that he found this kind of improvement very gainful.

In a statement given of the expence and profit of improving an enclosure of eight acres, the result is, for each acre,

Gain the first year (a potato crop),	-	L. 0 11 7
— second year (oats),	-	4 3 0
— third year ditto,	-	3 13 8

After which it will let for pasture at 1l. 5s. per acre.

a tract of land from the head of Lochgilp was lately taken by Mr. Macneil ; but it may be doubted whether it would be a gainful purchase. Campbelton Bay could be made to part with a few acres at an easier rate, if the town should be straitened for room ; but the expence might exceed the value for any other purpose.

With regard to waste grounds that are incapable of cultivation, but well adapted for planting, enough has been suggested in the preceeding chapter. Both taken together hold out such room for improvement, and such prospects of advantage, as no calculation can come up to. The great importance of these subjects may excuse the length at which they have been handled. The principal design of these pages is to suggest what may and ought to be done, for the improvement of the country, although there may be no prospect of its being done in a hurry.

CHAPTER XII.

IMPROVEMENTS.

SECT. I.—*Draining.*

DRAINING, together with enclosing, must be the foundation of all improvement in this county. Our arable and improveable lands lie, for the most part, at the foot of hills from which they are perpetually fed with under-water. Where the ground is of a loose gravelly texture, this water is constantly oozing out where it can get the readiest vent, and forms that cold and spouty soil, in which vegetation is retarded, if not destroyed by its chill. Where the ground is of a spongy and tenacious nature, this under-water forms it into mosses, marshes, and wet meadows or bogs, which can never be turned to much account until this water, or superfluous moisture, is drained off.

The first step towards draining, is to intercept this water which comes from the higher grounds, by a deep ditch, which may generally be directed so as to answer at the same time for a fence. From this ditch the water is to be conducted to another large ditch or master-drain. This ditch may also serve for an enclosure or subdivision to the lower grounds. It should be drawn where the ground is lowest, and be of a sufficient depth to admit the water from the other drains, which are to be made in the field, to fall into it. These drains should be parallel to the upper ditch, or nearly so: that is, they should run across the declivity of the ground, as otherwise they would be of no service. Their distances and depth must, in a great measure, depend upon the nature of the ground. The distances between the drains

must always be the less in proportion as the declivity of the ground is the greater. In ground that is nearly level, a drain draws water from both sides, but in steep ground it draws very little but from the upper side. The bottom of an upper drain should be horizontal, or level, with the surface of the next drain below it. The line of this drain may, therefore, be easily guessed by the eye, or more exactly fixed, by holding erect in your hand a stick, whose length is equal to the depth of the drain, and descending till a line stretched from the lower surface edge of the drain above to the top of the stick shall appear to be level. At a much greater distance than this you cannot safely make your drains. Even this may sometimes be too much. In ground nearly level, and of a tenacious or spongy nature, such as clay or moss, a rood, or from 16 to 18 feet, may be a sufficient distance.

In gravelly soil, where the water comes easily to the surface, it is enough to make drains about 30 inches deep, so that, when finished, they may be out of the reach of the plough or spade. But in moss or clay, it may be necessary to go deeper, as you cannot come to the source of the evil till you reach sand or gravel. If you cannot always submit to the expence of going so deep (which it would be best to do), you must at least, here and there, pierce or tap the bottom of the drain with a three inch augur, a sharp stake, or some such instrument, so as to reach the sand through the intervening clay or impervious stratum, and give the under-water a sufficient vent, to come up, or to let the upper-water down to the porous stratum. Into each of these holes there should be thrust a bush, to keep them from being filled up with mud.

A very ordinary degree of judgment and penetration may lead one to discover where the springs, or under-water, which poison any ground, are likely to be found in the greatest quantity; and one drain in that place, with abundant tap-

pings, may supersede the necessity of many others. In thus finding and carrying off the water at its source, lies much of the skill of draining*.

Drains should not have too great a fall, which would wear the bottom, and make the sides fall in. The water should be made to run freely, not to rush violently.

Where the ground is very soft, the drain must be made by degrees, allowing the edges to part with their water, and contract a firmness after one stratum or spit is taken out, before the taking out of another. Without this, the sides, by their weight of water and softness, will be apt to fall in and meet, before the work is finished.

* The celebrated drainer, Mr. Elkington, seems, from the notices given of his art, to take chiefly this method. He considers, first, whether the wet be owing to springs issuing from the higher ground, or to a generally moist and oozy bottom. If to the first of these causes, the drain is cut through the eye of the spring, or rather a little higher than the effect of the water is visible. If there appear to be several springs, the drain is cut in such a direction as to do most execution, by catching the greatest possible number of springs. But if the ground is generally moist, and no spring appears, the judgment is exercised in considering, from the nature of the ground, where the water is most likely to be found. After a line with a gentle fall is pitched upon, Mr. Elkington begins his drain at the lowest end, proceeding upwards to the place suspected. After the drain is sufficiently advanced, an attempt is made by boring to discover the spring. The borer is in the shape of a large augur, two 1-half, or three inches in diameter. It is made of different lengths, which screw one upon another. The upper part is one inch square. It is turned by two men, who have each an iron bar or handle, fitted in one end to the square part of the borer. If the attempt is successful, so that in consequence of the boring, the water issues in a sufficient quantity, this part of the business is completed; otherwise the drain is carried forward, and the trial by boring repeated till it succeeds; when the water boils up like a fountain, and is conveyed away in a covered stone drain. It is incredible what a large tract a few of these drains will dry, when the source of the water is discovered, as it seldom fails to be, on the first or second attempt by Mr. Elkington, though it may sometimes be as low as from 12 to 18 feet from the surface, according to the thickness of the different strata which lie over the sand or gravel where the water lodges.

Drains are either open or covered, and executed in various ways in different parts of the county. Where there is any considerable quantity, particularly of surface water, open drains are the surest; and they should be made with perpendicular sides, in order to keep the water within narrow bounds. But in land that is but moderately wet, it is better to make open drains in the form of a broad furrow, shelving so gently on the sides as to allow a cart to pass over them. The land will then have the appearance of large ridges, sloping gently from the top, to the drains or furrows on each side. If the ground is first planted with potatoes in the lazy-bed way, and every second or third furrow sloped in this manner after the potatoes are dug, and the parings thrown back into the furrow in the middle, and the top of the ridge raised, the work may be performed at a very trifling expence. Of these, as well as of other kinds of drains, there are many which are executed in the completest style about Inveraray, and are now finding their way into all parts of the county. In all level grounds, open drains, thus gently sloping on the sides, are found to be the best.

Covered (or hollow) drains are of different kinds, according to the nature of the ground, and the materials that may be found most convenient for making them. If stones, and especially flags, are at hand, the best and most durable drains are those which are laid with flags at the bottom, built with stones at the sides, then covered with flags at top, some small stones over and about the flags, and then a layer of heath or rushes, or a sod with the green side undermost for covering all, before the drain is filled and levelled. This construction answers well for a larger drain, which receives a considerable quantity of water from other lesser drains or conductors. But if the ground is firm, and neither the fall nor quantity of water great, the flagging of the bottom may not be necessary. The lesser drains may be made with any stones on

each side, and others over them, so as to leave about six inches square of an interval. They should then be filled up, for some inches, with small stones, and covered and levelled as above.

When only small stones are at hand, the drain may be made narrow at bottom, and the stones thrown in at random for a foot thick, and covered as before. This will clear the ground of stones as well as drain it.

If channelled gravel, or coarse sand be more convenient, the drain may be made to terminate at the bottom in a narrow angle, and filled up with five or six inches of such stuff, through which the superfluous moisture will find its way.

In stiff clay soils, where there are no stones, drains may be made, thus narrowing to a point at the bottom, and a rope of straw, rushes, or heath, three or four inches diameter, laid along it, and immediately covered with the matter that was dug out. In 12 or 18 months the straw will rot and melt away, the clay above it will be consolidated, and a durable arch or pipe will remain for the course of the water *.

In moss, or other ground that suits it, the turf drain is often the most convenient and always the cheapest. It is made by digging out two or three spits, according to the depth of the moss; and then, with a narrow spade tapering to a point (or even with a common peat spade), the last spit is dug out of the middle, so as to leave a shoulder on each side. Across this is laid the turf that was cut off the top, or any other thick and tough sod of a suitable length, with the green side

* The following is another mode of making the pipe-drain. The drain is dug to the necessary depth, and narrowed in the bottom, in which is laid a straight and smooth pole, six inches diameter at one end, and five at the other; with a ring fastened in the thickest end. The clay, or toughest part of the contents of the trench are first thrown in, and then the remainder, after which it is trod firmly down. By means of a rope fastened to the ring, the tree is drawn out to within a foot or two of the small or hinder end, and the same operation is repeated. *Account of Draining, &c.* p. 166.

under; after which the stuff that was dug out is turned in and levelled.

If broom, furze, heath, or brushwood may be easily got, the drain may be made wider than this at bottom, filled up for 16 or 18 inches with these materials; and over them a layer of turf or sod as before. The bushes will last the better if put in green. If dry, they will soon decay.

As the parts of moss or peat-earth, when once thoroughly dried, will not easily unite and cohere again, it is best to make such drains in the driest months, and not to turn in, upon the turf, the matter that was dug out, until it is well dried; as after that the water will easily filter through it into the drain; whereas, if turned in immediately, and before it has had time to dry, the parts will soon reunite, and by their sponginess retain the water, or conduct it over the drain, instead of allowing it to fall in. Upon this principle, it deserves to be tried, whether in the want of other materials, moss may be drained by only casting peats out of the drains, drying these peats as for fuel, and then turning them in, with all their dross, into the drain.

Every kind of drain should be at least from 30 to 36 inches deep; so that when finished, it may be out of the reach of the spade or plough.

In covering a drain, one should always begin at the top, so that any mud which gathers may be easily cleared downwards. If he proceeded in the contrary direction, the drain would be choked before he could be done with it.

If the ground is to be formed into ridges, they should have a proper descent, and be in a direction somewhat contrary to the drains, so that the one may help the other; the one carrying off the surface, and the other the under-water.

The expence of draining must always vary with the varying circumstances of ground and materials. Turf drains may cost in general from 2l. to 3l. and stone drains from 3l. to 4l.

an acre, at six yards distance. But this expence will be commonly repaid in the course of three or four years, and an acre of such ground is of more value ever after than three or four acres, or even more, in their natural state. So that the profit of draining and improving land is vastly greater than that of buying more. The one is obtained for three or four years purchase, the other not under 25 or 30. Where ground can be planted with potatoes in the lazy-bed way, and the materials for making drains in every second or third furrow easily got, whether turf or stone, all the expence will probably be paid by the potato crop itself. Is it possible in any other way, to lay out a little money to so much advantage?

Some soils have no depth to admit, nor under-water to require draining, yet are so spongy or tenacious as to retain wet in their surface, and of course are so cold, that neither corn, nor any grass, except a little of the coarser kind, will grow on them. Such ground may be cured by a coat of drift sand spread inch or two thick on the top, and then ploughed down *. If this is not easily got, gravel, which is probably in their under stratum, will be found a corrective; for most lands have their correctives in their under strata. The land may be formed into the shape of ridges, covered with a coat of this under stratum from the furrows on either side. When the land is pulverized a little by tillage, the water will ooze through, till it reach this sand or gravel, which will allow it to filtrate down into the furrows.

Spongy grounds of this kind, lying on a declivity, and unfit for cultivation, may have their pasture greatly mended by furrows drawn obliquely across them with the plough or spade, at proper distances, and with a little descent, having the sod

* Common sand may be applied to stiff clay, as well as to tough and tenacious mofs. It helps to warm all such soils, to make them more open and loose, and more fit for vegetation.

turned out on the lower side. These furrows, or little open drains, so easily made, would not only help to cure the ground of its chill, but might serve also as sluices for watering it, in situations capable of that great improvement *.

SECT. II.—Of *Paring and Burning*.

A few in this county have tried paring and burning, but to no great extent; and they soon saw cause to give it up. The heat of the ashes made the ground exert itself to produce one or two tolerable crops, and some dwarfish white clover where it did not grow before; but its strength was soon exhausted, and it was found difficult to bring it again to good order.

In shallow soil, this practice must be ruinous, as it consumes too much of its staple. Even in deep mosses it is far from being always proper, as the best soil is that which is uppermost, within the reach of the influence of the sun and air, and most replete with vegetable substances. It is preposterous therefore to destroy the best, in order to get at the worst. If the surface is tough and matted, it is better to reduce and correct it by the application of lime, if it can be procured at an easy rate.

If paring and burning is at any time advisable, it would seem to be after the upper stratum of a deep moss is exhausted by tillage, when it might be proper to burn it, in order to

* On sheep pastures of a spongy surface and nearly level, the following simple mode of carrying off the surface water, by means of a strong common plough, may be easily effected. "After turning up the furrows through the hollow parts of the field where the water is apt to stagnate, let a man with a spade pare off the loose soil, leaving the sod or grassy side about three inches thick, and then turning it back into the furrow, with the grass side up, as before. By this, a canal of three or four inches will be left in the bottom of the furrow, sufficient to discharge a considerable quantity of water, which will readily subside into it." *Account of Draining, &c.* p. 167.

get at fresh soil that may be more adapted to the purposes of vegetation. But even in this case, it might be better to carry away the exhausted surface to cover any contiguous field of sand, clay, or ground of any other quality opposite to that of moss; as it is found that any soil is greatly improved by mixing with it any other, of a different kind. Though both be barren by themselves, they may become fertile by being compounded.

As the practice of paring and burning, however, has its advocates, and as ashes are undoubtedly a powerful manure, it is probable that the failures complained of, have been owing in some measure to injudicious management, especially when tried on deep mosses. All mosses are better adapted for grass than for corn crops, which soon exhaust them; if they are not kept in good heart by manure, and a proper rotation. If, therefore, instead of taking three corn crops from such land, as is often done, only one or at most two white crops were taken, and the ground laid down with grass seeds, it might have answered well. The common way of bringing in mossy ground, is by planting it with potatoes in the lazy-bed way; after which the grass seeds should be sown with the first or second crop of oats that should be taken; or perhaps sown alone, without any oats at all. By this management there is reason to believe that the improvement would be considerable, and the melioration in the pasture cheaply gained; as the expence of paring and burning would be paid by the potato crop.

The burning should be done in calm weather, and when the clods should not be so dry as to burn fiercely, or too much. The fire should be smothered (as is done in charring wood), the smoke kept in as much as possible, and the clods not so much burned as pulverized. The soil, as well as the ashes, would be thus preserved, and the principle of vegetation not so much destroyed.

SECT. III.—*Of Manuring.*

Few parts of the kingdom have more advantage from natural manure than this county. Our great extent of sea-coast furnishes a vast variety of sea-ware, shell-sand, and oyster-shell banks. We abound almost everywhere with limestone; and as marl (which is of the same nature) is frequently found in countries which abound with limestone, there is reason to believe that when our farmers shall know better what marl is, and what its value, it may be discovered in many places where it has not yet been found. As yet it has been very little sought for, and very little used when found*. On the Duke of Argyll's property, about five or six miles from Campbelton, there is a great quantity of marl, of which farmers that were near it made some use above thirty years ago, and afterwards gave it up, till within these two or three years that they have tried it again. But now, as formerly, they seem to be rather disappointed in their expectations. This may be owing to their laying it on too sparingly, to their ploughing it down in a crude state, without allowing it to lie a year on the sward; and to their laying it, not on old ley to which it would do most good, but on poor run-out soil, which required more the application of cow's dung, or some such oily manure, than any calcareous stimulus.

As marl (like lime) acts chiefly as a stimulus, if the ground is not kept in good heart by applying dung, and observing a proper rotation of crops, it will soon exhaust it. Marl should be laid on the sward before the winter frosts, which will make it fall and mix with the ground, on which depends much of its effect.

Of the vast benefit of marl, when applied judiciously, there

* *i. e.* on the continent. It is much used in the Island of Lismore.

can be no doubt. Farmers should therefore be directed to look for it everywhere *, and told that it may be known by the fermentation raised in it by a little vinegar. To induce them to use it when found, they should know that it excels all other manures, and that a field in condition to receive it, and once well covered with it, needs hardly any more manure, under a proper rotation, during the currency of a 19 years lease. Of our small carts about 150 should be laid on an acre †. Like lime, it does the better of lying on the sward a year or two before it is ploughed down, that it may incorporate with the earth, and rot and ferment the sward. Dung too, as is the case with lime, will greatly add to its effect, especially on poor exhausted land. When both are well incorporated with the soil, by one or two ploughings, the benefit is immense. The English farmer is so sensible of this, that he often marls an acre of ground at the expence of from 10 to 20 pounds. But then it gives him little more trouble for 20 years, and the effect is visible even for 40. As few with us may be able or willing to begin with such spirit, where marl may be found, it may be proper to observe, that a less quantity at first, and again repeated, will answer the purpose tolerably well, although it would be better to do the work to purpose at first.

Lime has been long used as a manure ‡ in this county ; but

* "Marl may be looked for in places where the ground rises from a hollow on all sides but one, and where more water is observed to spring from the ground than what is seen to enter it. By attending to these two observations, a great deal of trouble may be saved in the course of searching for marl." *Stat. Acc.* Vol. XVII. p. 471.

† To carry it easily to a distance, it might be first burnt in a kiln or brick oven.

‡ Whether lime produces its effects as a manure, as a stimulus, as a dissolvent of vegetable substances, or as an attracter of oily particles, &c. from the atmosphere, is matter of dispute among philosophers, but of little moment to the farmer, if it only mends his crops. Probably it acts in these various ways. From the weight of lime when newly burnt, and the additional weight which it requires after being for some exposed to the air, some curious calculations

not yet so much as it ought. In many places farmers who have both the lime and the peats to burn it almost at the door, and who could therefore manure an acre for 30 or 40 shillings, seldom think of using it. So inattentive are many of them to their own interest in this respect, that landlords are sometimes obliged to make it a covenant that they shall burn a certain quantity of lime. But in Kintyre, where they are become fully sensible of its good effects, this is no longer necessary. The farmers on the Duke of Argyll's estate, especially, begin to consider a draw-kiln as a necessary appendage to every farm. A small kiln of this kind is scooped out and built in the face of a hill at a trifling expence, and requires not more than half the fuel which used to be spent in the temporary turf kilns raised on the field where the lime was to be spread. The shape of these kilns nearly resembles that of an inverted bottle. It must be observed that, where lime is most used in this county, they seldom lay it on to a sufficient quantity; which, on new, strong, or clayey soil, ought not to be less than 120 Winchester bushels of shell-lime, or about three times as much of slaked lime, to the acre. The first may be about 20, the other about 60 of our ordinary carts*. Land that has been once sufficiently limed ought not to have it repeated for 15 or 16 years after; nor ought it then to have much more than half the former quantity.

Land that is warm, light and loose, and already well pulverized, has little need of lime, and ought not to get much of it: neither ought any land that is poor and much exhausted. All

have been made of the number of tons weight thus attracted to an acre by the quantity of quick or shell-lime sufficient to cover it. Hence lime is found to have the effect of increasing the depth of the soil. It also renders it less retentive of water.

* When laid on in small quantities, at different times, the effect of the one is lost before the other comes to its aid, and neither of them can do much good, being too small to excite a fermentation. Doing things by halves will never answer well.

these lands require dung more than lime, as the strong land requires lime more than dung. Each kind of land should therefore have chiefly, though not solely, the kind of manure which it most needs *. From want of attention to these circumstances some lands have been hurt by lime.

Any land that is wet should be well drained before it is limed, as otherwise the lime can be of no service to it. Neither indeed could any other manure, as the water would effectually check every tendency to fermentation.

Whether lime should be laid on hot from the kiln, or after it has been long exposed to the air and become effete, is a question about which farmers are not agreed : a proof, perhaps, that the difference is not remarkable. Lime hot from the kiln and harrowed in with the grain on the seed-furrow, after the ground was well manured before, has been found to produce excellent crops here. In this manner it is thoroughly mixed with the soil, and kept from going too deep in the furrow, as happens when it is laid on the sward and immediately ploughed down, which is too often the case. When it is spread on the sward it should be at least a year, if not two or three, before the ground is turned up. In the mean time, the grass would be greatly meliorated, the lime would be incorporated with the soil, and the sward rotted and turned to manure ; so that the farmer would be amply paid for the interest of his money, both in his grass and corn. Besides, by lying thus exposed to the air, the lime would become fully saturated with whatever oils or substances it attracts from the atmosphere, and have their additional virtue superadded to its own †.

* In grounds which have no natural call for a particular kind of manure in preference to another, it will be proper frequently to vary the manure. A change of manure may be as proper as a change of seed. Nature seems to delight in change.

† It is certain, however, that lime, when harrowed in hot, and immediate-

Farmers would find their advantage still more in it if they would apply lime to the land oftener than they do in the way of compost; especially in light shallow soils exhausted by long croppings, which need staple as well as manure to repair their waste. A compost of earth, moss, dung, scourings of ditches, old earthen dikes, weeds (before they feed), or as many of these materials as could easily be got, mixed in stratum with lime made in the summer, allowed to ferment till the end of autumn, then mixed and turned over once or twice before it would be used in spring,—this would make the manure go twice as far as at present, and largely repay the additional expence and trouble. Lime should always be slaked before it is used in composts.

Now that the duty is happily taken off coals carried coastwise, would all farmers and proprietors who could conveniently get them, allow themselves to make more use of them for fuel, and employ the time which used to be consumed on peats, in draining and making compost manures, this would keep in their pockets those larger sums which now go for meal, and enable them to rear more cattle and of a better kind. These things will come round in time. A few will be wise enough to set the example; and many, it is hoped, will follow it.

Sea-ware, along all our coast, is much used as a manure, though not always cared for so much as it ought. Its effect is not so lasting as that of dung; nor is it so great

ly from the kiln, as mentioned above, has a more quick effect. Lime in receiving the first moisture after it is burnt, undergoes a fermentation, and it is certainly best that this process should go on in the ground, rather than out of it, as it will greatly help to loosen and pulverize it. When, therefore, lime is laid on red land, and not on the fward, it should as quickly as possible be spread and harrowed in hot from the kiln, the burning of which should be so timed as to meet the season when the ground is in proper order and readiness to receive it.

when laid on in winter as in April or May, when it is riper and more impregnated with salts *. What comes ashore during summer, after the ground is sown, the more careful farmers gather into heaps, or spread on ley-grounds. In either way it turns to little account. Much of the heap melts away, and much of what is spread dies and shrivels to nothing. If mixed with earth, moss, ferns, weeds, &c. in a compost, it would produce a quick and strong fermentation, and all its juices would be preserved. This is the way to make the most of this great gift of Providence; and the farmer and cottager both should thus increase their store of manure.

Shell-sand, found in many of our bays, has been long used as a manure for corn and meadow lands, which it greatly meliorates. By this manure not only the quantity of grass is greatly increased, but its quality also mended. It answers well on any soil, but particularly on stiff clay, and on mossy and spongy land, as (besides its effect as a manure) it destroys the tenacity of their parts, and helps to pulverize the one and drain the other. Its value as a manure depends on the proportion which the shell bears to the sand; which, in some places is greater and in others less. The best sand is found on some of the islands, particularly in Oronsay, from which it is frequently carried to the continent. Perhaps this is the best and cheapest manure that we have for hay-meadows. There is also a bank of good sand on Elan-Davar, at the mouth of Campbeltown harbour. The shores of Kilfinan in Cowal also abound in shell-sand. Even sea-sand, which does not appear to have any mixture of shells, is found to be beneficial, especially to moss or clay grounds: Some

* As salt is a good manure, sea-water (of which a ton contains a bushel of salt) has been also recommended. It promotes putrefaction, and may be applied to peat-earth, dung-heaps, and composts with advantage.

of the farmers in Kintyre apply it to such lands with great advantage. On the shore of Dunaverty, in Kintyre, and in some other places, some coral is thrown ashore; which proves an excellent and lasting manure, but the quantity is not so considerable as to be of any extensive service.

In Loch Tarbert there is an immense quantity of oyster-shells, almost unmixed with any sand, when the thin stratum above them is removed. The extent of this astonishing mass of shells is unknown; but it is probable it can never be exhausted. A vast tract of improveable moorish land in the neighbourhood may some time or other show that Providence did not place this fund of manure in vain so near it. For such moorish heathy ground these sea-shells are the fittest manure; but their use ought not to be confined to it. In order to make the carriage the lighter, and the effect the quicker, perhaps it would be worth while to burn them first, as is sometimes done to marl. The kiln might be made with one or two eyes running into it about half-way at the bottom, with some flags or stones rudely arched over them, the kiln then filled with shells, and fed with fire for a day or two, as might be found necessary. Lime is burned in this way in the space of from two to three days; and shells, already in a mouldering state, would take much less both of time and fuel. The operation would not be hindered by the tides, as these shells are found also under the surface of some of the fields beyond the sea-mark.

Stratums of these oyster-shells are also to be found at the head of Loch-Caolisport; but there (so slow is the progress of improvement!) they have not yet begun to use them as a manure. Probably the time is not distant when these shells will become an article of commerce, and be carried at least along all the shores of Kintyre*.

* The following extract from the Statistical Account of the parish of

The quantity of animal dung collected in our farm-yards is not so great as it might, owing to our inattention in furnishing our cattle with litter in winter, and in collecting weeds in summer.* Straw is so scarce in most places, that, until we shall have learned to raise more of green crops, much of it cannot be spared for litter. But where ferns abound, they would answer the purpose as well, and should therefore be carefully laid up in their withered state in autumn, when they are not cut green for manure in summer*. Many use them in both ways; but more there are who neglect them.

More pains should also be taken to keep dunghills compact and close, so as to make them ferment properly. More atten-

Kirkmabreck, in Galloway, may show people here in what estimation this kind of manure is held elsewhere. "The principal manure used for improving land is sea-shells, of which there is an almost inexhaustible quantity, not only within the high-water mark on this side of Wigton Bay, but also in the dry land, several hundred yards from the shore. These shells are sold at fivepence per ton, 25 of which is sufficient for an acre; and proves a cheap and excellent manure, preferable to either lime or marl. Many thousand tons of these shells are annually carried (by vessels constantly employed in the business) all round the coast, and sometimes even to the Isle of Man. These shells have been used with great advantage for the improvement of barren heathy land, inasmuch that many hundreds of acres in this parish, originally not worth more than 2s. per acre, have been made worth from 10s. to 15s. per acre. Yet this, like every other advantage that is easily attained, is not duly prized; for upwards of 1000 acres in this parish, though capable of cultivation, lie in a state of nature, covered with heath, and almost good for nothing. A little calculation might serve to show landlords that on nothing could they lay out their money to so much advantage. As for a tenant, where he has only a lease for 19 years, and perhaps his encouragement not great otherwise, it cannot be expected he should do much in the cultivation of barren land. The tenant, however, might well lay these shells on land already cultivated."

* In Suffolk they lay up stacks of heath in the farm-yards for litter; and it is found when rotten to make good dung. How easily might we thus increase our manure.

tion should likewise be paid to the stance of them; for they are sometimes placed so near the byre and stable doors, that the cattle must be continually wading through them, to the great injury both of dung and cattle. Sometimes, too, they are injudiciously placed in hollows, and thereby kept so cold and wet as to prevent all fermentation. If the stance is in a hollow, that hollow should every year be filled up with earth before any dung is laid down; and this earth would be as good manure as the dung itself, when fully saturated with its juices. If this is not done, a level spot should be chosen; and at a little distance from it should be dug a trench, into which should be thrown straw, weeds, earth, &c. to receive the washings or oozings from the dunghill. All the animal urine from the byre and stable should in like manner be conducted to such pits by proper gutters. Chamber-lye, and soap-lye in times of washing, and the droppings of the cattle and other sweepings about the doors, should also be cared for, and added to the heap. Cattle that are housed should always be allowed, after being set up, to stand a little before they are turned out, in order to leave their dung, and not drop it about the doors, where it would turn to no account. —These observations may be thought too minute; but they are not unimportant: and the farmer should always remember, that adding to his manure is adding to his corn.

As dung must always be the principal manure of every farm, all possible care should be taken to increase its quantity and to mend its quality. Every thing capable of being made dung should be thrown into the dunghill. The surface should be equally spread, and the sides compactly gathered, the better to make it ferment and putrefy. This operation is necessary, in order to destroy the seeds of any weeds that may be mixed with dung, to rot any straw that may be in it, and to digest and pulverize the whole, so as to make it mix more intimately with the soil; for on this depends not a little of

its good effect. This process of fermentation is particularly necessary in horse-dung, as it is not so well digested as that of sheep and cows, which chew the cud. But it is the better of having other dung, or some cold materials mixed with it, as of itself it is so hot as to perspire and evaporate too much of its juices*.

Dung should also be minutely broken and carefully spread, in order to incorporate and mix the more equally with the soil; which it does best when it is moist, and when the ground is best pulverized, before the seed is sown. The practice of laying it unmixed in the bottom of potato drills cannot therefore be commended.

The folding of cows and sheep upon fields, in order to manure them, was, till of late, common over all this county; but is now given up in most parts of it. The practice was certainly hurtful to the cattle in the extent to which it was carried on; for they were imprisoned there, at night and noon, in all weathers, from May till November, or till the field was dunged. On farms mostly arable, and under small stocks, perhaps it would be better to moderate the custom than to give it up entirely, as many of our fields are so situated that they cannot be manured in any other way; and it would not be wise to neglect them altogether. Even if pasture should be our chief object, it is greatly promoted by bringing land at stated intervals under the plough, and laying it down again with new grasses. Cattle and sheep, those especially of the native breed, if well fed and cared for, would not suffer much by being folded at night in mild weather. Sheep especially might be of great benefit in this respect. In many parts of England, the great purpose for which they

* Horse-dung, ashes, and other hot manures, are best adapted for cold lands; cow-dung, and such cold manures, for land that is dry, warm, and sandy.

keep these useful animals is for making them the carriers of dung, especially in situations where the distance and steepness of the hills would not admit of their being manured in any other way. For such a purpose our Highland breed of sheep are well calculated, and ought to be cherished. They are light and hardy, and can with ease travel a mile or two for their food, and carry their dung back to the fold. A flock of 100 sheep, with their lambs, would, if well fed, manure about an acre of land in a fortnight *. To the rich storemaster this may be no object; but to the ordinary farmer, who would raise corn for his family or for the market, it is a matter of great importance. It is so especially in situations which admit of no other mode of manuring, and which would soon be covered with heath, if altogether neglected. It deserves also to be considered, that these high fields may (besides their produce) be of great use in giving a change of feed. In some parts of the county, the elevation of one field above another, in the same farm, may sometimes be near 1000 feet; so that the difference between them in soil and climate may be almost as great as between one county and another. To this it may be owing that corn seed in the Highlands is tolerably good in some places where it has been very seldom changed. Let us then give up no advantage that we have, but rather add to them all that we can.

Moss, or peat-earth, is sometimes turned out on ley ground in summer or early in autumn, and found to be beneficial; especially when laid on thin sandy or gravelly soil. Some give the ground a sprinkling of lime before the moss is laid on. Others take a better way, by mixing both with other materials in a compost, where they first undergo a fermentation. Three parts of moss and one of dung, with the addi-

* In Wiltshire 1000 sheep are allowed to manure about three-fourths of a statute acre per night. But our sheep are not so large, nor so well fed.

tion of some flaked lime will make a good compost. The heap should be formed at top like the roof of a house, and covered with thin turf to make it cast the rain, as too much wet would impede the fermenting process. When moss is used by itself, it should lie on the ground long enough to let it dry and pulverize before it is ploughed down; for if it is buried in its wet spongy state, and in large clods, it will retain its water and rather hurt than help the soil.

The dust of dried peats, and the foundations of peat-stacks have been found an excellent manure for potatoes; but the experiments may not yet be so numerous as to enable one to recommend this manure boldly. If on further trial it shall be found to answer, it may prove of great service in a country which abounds with moss; as peats might then be cast for manure as well as for fuel, and the poor be enabled to raise a greater quantity of potatoes*.

As the parts of peat-earth, once thoroughly dried and separated, will not readily cohere again, they will, if plentifully laid on, help much to dry wet or spouty soil, and to destroy the tenacity of stiff clayey grounds. Perhaps the chief virtue of this manure lies in being applied to the soil that best suits it. The natural defect of any soil is cured by mixing with it any other soil of opposite qualities; as gravel or sand with moss or clay, and *vice versa*. Most soils have their cure in their own under stratum. Clay commonly has sand under it, and moss commonly lies on sand or gravel. Some of these under stratum cast out of furrows upon the ridges, as potatoes are covered in the lazy-bed way, would in many cases greatly mend the surface soil.

* Since writing the above, I have met with strong recommendations of this manure. It is much used in different parts of Lancashire. They cut the moss two or three feet deep, in small pieces as we do our peats; and after it has got the summer's drought and the winter's frost, by which it is impregnated with vital air, they cart it away, and lay it on the land.

Lands which have a depth of soil and are naturally good, but exhausted by long tillage, are wonderfully meliorated by trenching. The difference between doing this (a spit and a half deep) and ploughing, is so inconsiderable, that the difference in one year's crop will generally repay it, and the effect will be visible for many years after. Besides the gain which the owner will derive from thus bringing fresh mould into action from time to time, it will furnish employment to the labouring poor, and so add pleasure to the profit. Ground that has been trenched formerly may be done over again for 30s. or less, per acre; and what was never trenched, for double this, or little more, according to the nature of the ground.

When there are large turbaries or mosses, peat ashes might be made in great abundance in summer, and if kept dry so as to preserve their salts, would be a valuable manure, applied as a top-dressing on dry lands in spring, at the rate of 15 or 20 bushels to the acre. This would greatly mend the quantity and quality of meadow hay, and would also answer well on strong dry clays. In many parts of England they carry this manure 15 or 20 miles, though we put no value upon it, because it is so easily obtained. Even the ashes made in a farmer's family throughout the year, though of little value when thrown on the dunghill, would be of great account if kept in a dry state till used in spring as a top-dressing to corn, clover, or meadow ground.

In short, every animal and vegetable substance whatever, is capable of being converted into dung, and nothing should be lost; for, according to our homely proverb, "*muck is the mother of the meal-chest.*"

Season of laying on Dung.

The proper season for laying dung on meadow or ley grounds, is when they are bare, after being mowed or pa-

stured, at any time from the begining of July to the middle of September. The sooner in the season it is laid on, the better; as then the grafs will spring the sooner through it, and save its substance from being washed away by the rain or incorporated by the sun. The greater heat of the season at that time too, and especially if it be moist cloudy weather when it is laid out, will make it ferment the sooner, and incorporate with the sward; so that it will produce in that very season a great increase of grafs.

On arable lands that are to be ploughed before winter, the dung should be laid on as soon as possible after the crop is removed, in order to rot the stubble and weeds, while the sap is in them; which will be a considerable addition to the dung. The sooner it is ploughed down the better, as it would greatly suffer by being exposed to frosts or rains. It should not, if possible, lie uncovered a single day.

If dung cannot be laid on ley or meadow in time to let the grafs cover it, and on arable land in time to plough it down before winter, it is best in either case not to lay it on till spring; as otherwise much of its virtue would be lost. In the meantime, if the farmer wishes to have the carrying of his dung out of hand, it may be laid on the field in which it is to be used, in an oblong heap, compactly made, and allowed to lie so, till the warmth of spring shall make it ferment; immediately after which it should be minutely spread, and ploughed down as soon as possible, and before its heat and juices have had time to evaporate. Dung, if kept long after its fermentation is over, will lose much of its virtues.

As our cattle are poorly fed in winter, their dung is poor of course; so that the ground should have the greater quantity laid on, to make up for its defect in quality. It is best to manure no more than can be manured well.

SECT. IV.—Weeding.

THE destroying of weeds by fallowing, drilling, hand-hoeing, and hand-weeding, is a very essential part of farming. But with us it is woefully neglected, except in the case of potato crops and flax, and a little that is done in pulling thistles out of the growing corn in summer. Few of our fields have ever been under a fallow; and many of them never under a drilled or hoed crop. It may well be supposed, therefore, that they are generally very foul; which is indeed the case. The weeds make sometimes the bulkier part of the crop. How much better would it be to fallow a dirty field one year, and to have double the usual crop in the next? In poor fields, which never come under a drilled crop, there is no other way of destroying quicken-grass, wild mustard, wild marigold, and other annuals with which those fields abound. Without this or some drilled crop, abundance of manure will only give abundance of weeds.

Many of our fields when left out to rest, abound in large weeds, especially ragwort and thistles. As these have winged seeds, one field will poison a dozen; and according to the proverb, "*One year's seeding is seven year's weeding.*" A few farmers, and but a few, are at pains to cut them down in July, before they seed, by which they not only clean the ground, but add to their manure. Might not every herd have a weed-hook*, and a small bribe, for cutting down every large weed he may happen to meet with? Most of these large weeds, if cut at the surface when in bloom, would bleed to death. It is to be hoped that every farmer will soon see the advantage of converting weeds to manure; and remember that if he tolerates the weeds he must want the corn; as they cannot both of them thrive together.

* A small sharp knife, or hooked iron, fixed on the end of a staff.

Great care should be taken that the grain which is sown may be perfectly free of the small seeds of weeds : for these are too often sown with the grain in great abundance. Care should also be taken to keep any small seeds winnowed from the corn from going to the dunghill, where some of them might escape putrefaction, and live to do more mischief. The safest way is to burn them.

SECT. V.—*Watering.*

THE watering of pasture and meadow grounds is justly considered as the greatest improvement which has taken place in the management of land in modern times. Formerly water was used only to moisten, but now it is found to manure the ground. In some parts of England this improvement has been long known, though it was not till lately that it attracted the general attention of farmers. In this county so little has been done in this way as yet that it is hardly worth the mentioning. The Duke of Argyle, who always sets the example in every useful improvement, has lately sent a flooder to inspect several parts of his estate, with a view of introducing this improvement ; and there is no reason to doubt but the same beneficial effects will follow as in England, and that others will follow the example.

Land brought under this management in England, whatever be its kind or quality, is increased to double or treble its former value *. It requires no dung. It raises grass in the spring a full month sooner than the same fields could otherwise be made to yield it. The spring feed is worth

* Sometimes much more. Mr Young, in his Agricultural Report of Suffolk, says, " meadows which formerly let at 5s. the acre, now, after watering, let " at 40s. and are valued at 60s." Mountain pasture might be improved in this manner as well as meadows.

at least a guinea per acre of meadow ground. It will yield afterwards two tons of hay per acre, and the latter math of that acre again is estimated at 20 shillings*.

Such are the accounts commonly given of the effects of watering in England. Accordingly there are in only one county (that of Wilts), from 15,000 to 20,000 acres under this management; and no less than 50,000 in the county of Dorset. Is it not high time, then, that we should thus improve the abundance of water with which we are supplied from every hill? That it would be highly beneficial to do so cannot admit of a doubt. Nature herself shows it. Every little stream which rushes down along the mountain, when it comes to any plain where it occasionally overflows its banks, has there meliorated the herbage. There (if it is not a marsh, which requires a little art to co-operate with nature), the heath and coarse grass are extirpated, and a close, fine, and sweet pile has occupied their room. Any person who has occasion to traverse our hills need only look about him, and he will invariably see, that in whatever place, high or low, a stream has the opportunity of frequently overflowing its banks, there is a beautiful green, when all around it is a dismal or comparatively barren heath. In like manner, whenever any large stream has a plain at the foot of it (or *inver*), so low as to admit of being frequently overflowed in

* Mr Wright, curate of South Cerney, who has wrote on this subject, says, that in his parish there are 300 acres watered by art, of which none were worth above 10s. about 20 years ago, and that now the worst of them will let for two guineas; and that the profit arising from this management, upon the whole, can be no less than 1000l. a-year. He instances a field of about seven acres, the spring feed of which sold for seven guineas, and supported near 200 sheep from the first of March till the first of May; the hay of which afterwards sold for 30 guineas, and the after-math for seven. A still stronger proof of the efficacy of watering, is another instance which he gives of a field of seven acres, the whole crop of which, before watering, sold for two pounds, but which has ever since been let at the rent of 7l. per acre.

the winter, we are sure of seeing an early spring of grass, and an excellent crop of meadow hay. A large plain of this kind, consisting of some hundreds of acres, lies at the foot of the water of Urchay, and yields, in consequence of its being frequently overflowed in winter, a very ample crop of hay every year; and that for time out of mind, without any other manure. Similar, though smaller instances occur in all parts of the county, and plainly tell us how much we may avail ourselves of our streams of water.

Watering is an improvement peculiarly calculated for this county, where the rearing of cattle is the great and general object, and where it would be of the highest consequence to increase their food, and of course their number. The streams of water are so numerous and copious that hardly any can be at a loss for as much as he chooses; and they come from such a height that there will be little trouble or expence in conducting them to any part of the lower grounds. We are under no necessity of raising the water by opposing mounds and dams, as in other places; so that we can carry on this improvement upon much easier terms than our English or Lowland neighbours; and may therefore reckon upon so much the greater advantage from it. Our soil may not perhaps be so good as theirs, but still we may improve it, and be gainers in the same proportion. And if we can make one acre to be of as much value as several in their natural state, we certainly procure this great advantage very cheaply.

But to increase the quantity of food for cattle is not the only, nor indeed the greatest advantage of this valuable improvement. It is still of more consequence to have that food early in the spring, when we most need it. To the starved condition of our cattle in spring, it is no doubt owing that they are often so diminutive in their size, and so unsightly in their shape. When the young of any cattle are starved and stunted in their youth at first, they not only never

get the better of this misfortune themselves, but also convey their form and size to their offspring. Whereas plenty of milk and of grafs for the young and their dams, if obtained early in the spring, would give them such life and vigour and size, as to make them appear a quite different breed from what they are at present. Now the effect of watering in England is, that it produces abundance of grafs by the first of March: and though in our climate it should not be in the same forwardness * till near a month later, still we should have it at least a month earlier than otherwise; which would prove of unspeakable advantage to our young cattle, whether lambs or calves, by furnishing them early with plenty of food. This would keep them always in a growing state, mend their size and their shape, and soon mend the whole breed.

The astonishing perfection to which the famous Mr Bakewell brought his breed of cattle in England, may be partly ascribed to his having practised watering so much earlier than any other in that part of the kingdom; and though he cannot be accounted the inventor of that art, he had at least the honour and advantage of turning the effects of watering to the best account, by feeding his young cattle upon it to the full, and thereby improving both their shape and their size. And there is no reason to doubt that a similar management would produce a similar effect upon our cattle in Argyleshire.

Cattle is our staple commodity, and to encrease their number, and improve their size and their breed, are objects deserving our attention, and most likely to be attained, as in England, by introducing the practice of watering our pasture and meadow grounds. In England the stock of a farm has been known to sell for more money than would have

* The forwardness will depend much on the soil, shelter, and exposure; all which should be attended to, especially in one field, for first use.

bought the farm itself at 30 years purchase*. Is it not time to learn from our neighbours how to make the most of our advantages?

Having stated the advantages of watering, it remains to direct the farmer how to carry on the operation. But previous to this, it may be proper to say a little upon the principles on which water produces on the soil those effects which are ascribed to it; as the directions will be the better understood, when we are first acquainted with the rational grounds upon which they are founded.

What constitutes the food of plants has been matter of much investigation among philosophers. No doubt a considerable part of it consists of the parts of animal and vegetable substances dissolved by putrefaction so minutely that they may be received and absorbed by the vessels of other plants again. To this process all the elements contribute their part, but how it is carried on is a secret which we shall leave to philosophers to extort from nature if they can. Enough for us to know that water is necessary to vegetation; and that abundance of it, when administered skilfully, will greatly promote it. Whether it does this merely as an element, or only as a medium to convey to herbs the volatilized particles of matter, is of little moment to the practical farmer to know. Probably it acts in both capacities, and therefore the more muddy it is, the better; as then it has the advantages of other adventitious qualities superadded to its own.

A field of seven acres in South Cerney was let a few years ago for 10s. an acre. It has been since watered by a stream which receives all the mud of half a mile of a public road;

* Mr. Fowler, in Leicestershire, rented a farm of between 300 and 400 acres, at 210l. a-year. In May 1791, his black cattle and sheep *only* were sold by auction for 6593l. 10s. Sterling. This farm is said to have been let at its full value, though not 10s. an acre. So that we have abundance of land equally good.

in consequence of which it is become the richest land in the parish, and has produced at one crop 18 loads of hay, of above 25 cwt. each. A field in Dorsetshire (mentioned by Mr. Boswell, who writes on this subject) was watered by a clear spring, rising just above it, in a barren sandy heath, "and the event answered the most sanguine wishes of the proprietor." So that, according to the general doctrine upon this subject, any water * will do much good (if not impregnated with minerals), but that which is turbid or muddy ought, when it can be had, to be preferred. The washings of farm-yards, lint-ponds, and the turbid temporary floods, occasioned by sudden showers, ought all to be received into proper ditches, and directed over the land, instead of allowing them to run useless in their natural channels.

Moss, or peat-bog, abounds in this county. The substance of this, according to naturalists, is corrupted vegetables, and therefore a proper food for living plants. When a stream can be so directed as to wash such bogs into pasture or meadow ground, they will do much good, especially if they are brought to light gravelly soil, whose qualities are the opposite of moss: for soils of opposite qualities will always correct and amend each other.

In speaking of the principles on which watering produces its effect, it may be observed, that it is a well-known fact, that if a piece of timber is kept always in water, or always dry, it may last for ages without being corrupted or decomposed. But if it is kept one while in water, and another while exposed to the air, its particles will soon be decomposed, and moulder away to brittle dust. It is the same with a piece of earth. Keep it always wet, or always dry,

* The purest water contains a large proportion of earth. Boyle found an ounce of common water contained six drams of a white light earth, indissoluble in water. This earth is probably absorbed by the grass plants, as the water passes along.

and its nature and quality will remain unchanged; as the wet marsh and dry hill will equally testify, by being equally barren and unfruitful. The rays of the sun, opposed by a mass of mud, can penetrate very little into the one; and the rains running along the surface, can as little penetrate into the other; so that the verdure of both is scanty: at least it is scanty on the hill, and coarse and vile in the marsh. But let the water and sun alternately act upon either, by soaking and drying it by turns, and you will soon decompose its parts, and allow the roots of the grass and plants to penetrate the soil with ease, seek their food at a distance, and that in the just temperature which they require for thriving. Then the finer grasses (which have also the finest roots) will be able to shoot their fibres, and forage for food; and the consequence will be, that they will grow thick and luxuriant; and so starve and choke those coarser plants, whose strong roots only could penetrate the ground before, and live in it, as their peculiar property. Accordingly, the watering of a field will be found to mend the quality of the grass, as well as to add to its quantity*.

This account of the manner in which water, at least partly, produces its effect, will direct much to the attainment of the end proposed; by teaching to make the water and sun

* Nothing improves land or grass so much as watering. "The herbage, if coarse at first becomes finer; the soil, if swampy, becomes sound; the depth of its mould is augmented; and its quality is meliorated every year."

The writer has been for many years in the use of sowing clover and ryegrass, but never found the second year's crop worth the saving for hay till last year, when, after having regularly watered the field, the second year's crop was at least as good as that of the first. A judicious farmer who had remarked its luxuriance, requested to have the seed of the ryegrass saved, as he thought it of the true biennial kind, which he had been long in quest of; adding, that his second year's crop was not worth the saving. Upon further explanation, however, it turned out that both the seeds came from the same shop, so that the difference might fairly be ascribed to watering.

alternately act upon the soil, to pulverize it: the water, chiefly in winter and early in spring; and the sun, chiefly in summer, when it has most effect, and when the grass might be hurt by flooding it. The full effect of this improvement, however, is not to be expected the first or second year: but the longer it is continued, the soil will still be mending. If the soil be open, warm, and sandy, the effect will be more immediate; but if it be swampy, strong, and rusty, the effect will be slower. In no case, however, will any one who conducts the improvement with skill have cause to repent of his undertaking.

In order to understand the mode of watering meadows properly, it would be necessary to see the operation. The following directions, however, may be of some service*. Pitch upon a field to which you can easily convey water; and from which you can as easily remove it. If it is wet, or troubled with top-water, your first care must be to drain it, and keep off the top-water by a head-ditch: for the watering of wet ground would be only adding to its disease. Your head-ditch should, if possible, be so directed as to serve at the same time for a fence, and a reservoir to water the field below. If it is requisite only for the last purpose, it need not be so wide as a fence. A ditch of three feet wide and two deep, may suit a field of a few acres. Let the lower edge of it be built firmly, so as to support the water, at least three or four inches above the surface of the field, with small flood-gates of timber, to let the water run out upon the field, or to stop it at pleasure. If the ground is unequal below, these should be at no great distance (per-

* It is proper to observe that the directions given on this subject admit of great latitude; so that the practitioner need not be afraid of a failure, if circumstances should make it necessary in some measure to depart from them. The Sovereign Ruler of the Seasons gives not every year the same measure of rain and sunshine, yet in no year does the husbandman lose his labour.

haps 12 or 15 yards asunder), so that you may lead the water in any necessary direction, in straight or curved lines, as the surface may require. The water itself will show you the level of these lines; as it will also correct any mistake of the eye in drawing the head-ditch, if you have not a proper level*. If the field has a sensible descent, so much the better, as the water has the more effect when it runs rapidly, and is no where allowed to stagnate. If the distance from the top to the bottom of the field is considerable, it is better to make one or more other ditches at proper intervals across it, than to allow the same water to run over it all; as it is found to part with most of its vegetative quality by running over a considerable extent of grass, which absorbs its nutritive particles as it passes along. When the water which entered the field muddy, has run so far as to become perfectly clear and limpid, it is best to let it run no farther, unless the land needs to be pulverized more than manured. If the land is spongy or swampy, these cross ditches are the better of being at no great distance; as they will help to drain the soil one while, as well as water it the other, and will conduce much to bring it in a short time to a sound and firm state.

If the ground which you wish to water has been formerly arable, and shaped into large broad ridges, the easiest way is to cut a little bed for the water along the top of the ridge, and let it run over on each side, throwing here and there obstructions in its way, to turn it out of its channel. The length of the ridge will direct you to give the proper size to

* A rafter level, with a cross bar, marked in the middle; and having a line and plummet, made like a mason's level, will answer the purpose; and may be made with little trouble. The span may be 10 or 12 feet. For the more easy carriage, the two sides and one end of the cross bar may be made to move on their nails, so that the three may fold together when the pin is taken out of the other end of the cross rafter.

this bed or channel of the water, which ought to grow less and less, in proportion as it approaches the end of the ridge, as the farther it runs the less water is needed. This direction, and that of throwing obstructions here and there in the way of the water, is applicable to every other little canal or sluice that may be requisite in the field, whether it is formed into ridges or not. In short, your business is to make the water run, from one to two inches deep, over every part of the field, and to keep it as much as you can a brisk or rapid motion. On the rapidity of the motion depends much of the effect.

If you cannot easily command as much water as will cover the field at once, you can water it by turns. Abundance of water will do no harm, provided it be no more than you can easily manage, without breaking the surface, or hurting your canals; of which you must especially beware in time of heavy rains or great floods.

As soon as the fields are eaten bare in harvest, all the ditches and canals should be clear and ready, so as to catch, if possible, the first floods after Michaelmas, as the waters will be then enriched by the corrupted particles of all the vegetables which fell to the ground in autumn. A good soaking at this time, if it can be had, is of more value than all that can be done afterwards. The water may be kept on for about a fortnight, if it be open light soil; but for a longer time (three or four weeks), if it be strong or clayey soil, and especially if it be rushy. The water should then be turned off for a day or two in the first case, and a week in the latter, to give the ground air, which will add to the effect of the watering. The operation is then from time to time repeated, taking always particular care to turn the field as dry as possible in the intervals between the waterings. In December and January, if it be not open weather, it may do as well to have the field generally flooded, as the running water

will keep the frost from going much into the ground, and hurting the grafs-roots.

When the field is under water, it will be proper to go once or twice a-week over it, to see that it be all covered, and that no obstruction has fallen in the course of the canals. In February the water should be on but for a short time; for then, if it is on for many days, especially in sunny weather, it is apt, wherever it stagnates, to get a white scum, which is an indication of putrefaction begun in the grafs or roots, and a sign that it is on too long, and ought immediately to be turned off.

When the grafs is an inch or a little more in length, the watering may be given up, if there is not such frost as might hurt it; in which case the water may be thrown on at night to save it from the frost, and in the day it may be exposed to the genial beams of the sun, which from this time forward is the main requisite. But if this attention be thought troublesome, the watering may be given up at such time as will allow the grafs a day or two to dry and harden before the frost comes on; after which it will not so readily be hurt. Upon the whole, it is thought better not to water when it is likely to freeze upon the grafs.

If the season is kindly, the ground will probably be fit for being pastured some time towards the end of March; but unless it be firm dry soil, none but sheep or young light cattle should be allowed to feed upon it. It is particularly fitted for calves, sheep, and lambs; and to them the softer parts especially should be entirely devoted. After it is eaten bare, as early in May as other grafs is in forwardness, it may be watered for a few days, and then allowed to remain for hay, if the farmer chooses. In England, land under this management is commonly saved the first week of May*, and fit for

* When late of being saved, the hay is too soft and woolly.

being cut in six or seven weeks thereafter, when it yields at least two tons of hay per acre. With us it may possibly take a little longer time, and for some years may perhaps not yield quite so much; but still the crop may be very profitable, and the more so, as we are generally scarce of winter provender. After the crop is removed, the ground should be again watered for two or three days, and then sowed for a few weeks, till it is fit for being pastured.

On this head it is proper to mention an observation to be met with in most of the writings on this subject. It is, that lands watered in any of the summer months, though but for a day or two, produce grass on which it is not safe to allow sheep to pasture, as it causes the disease called the *rot*; whereas the watering in autumn, winter, or spring, removes the cause of this disease from meadows which had it. But this, if it should be found to hold here, will occasion no inconvenience, as other cattle may be turned upon the grass produced by summer watering.

The above directions may suffice, when aided by the ingenuity of the Highlander *. His own experience will soon

* It has been already observed, that these directions, though agreeable to the general practice, admit of great latitude. This will appear from the following account of the celebrated Mr. Bakewell's practice. "Mr. Bakewell has been in the practice of watering his meadow and pasture lands, which he considers a great improvement, as superseding the necessity of manure. He has no regular or fixed period for watering, as in Wiltshire, but keeps watering all the year round, cutting generally four times in the season, and giving what is cut green to the cattle in the house. He has mowers constantly at work, and says he keeps cutting till Christmas. The time and manner of watering, Mr. Bakewell says, is very discretionary, and depends much upon situation. When very hot, the water is allowed to continue forty-eight hours; when moderate, about four days; and when cold, about two weeks. Watering is one of the greatest means of improvement that can possibly be introduced into many parts of Scotland. Mr. Bakewell thinks it would also be of considerable benefit even to arable land, where it could be accomplished." *Observations on Sheep-farming, &c.*

stand him in more stead than many precepts. What is to be feared is, that he may not readily attempt the business, nor submit to the labour and trouble here prescribed to him. It will, however, infer but little expence or trouble to make the experiment upon a small spot; and, if he does it fairly, the success may allure him to do more with alacrity. But if any will not be persuaded even to this, let him at least turn the mountain stream here and there out of its course, where he can do it with greatest ease, and let it occasionally spread itself along the face of the hills, in such a measure as will not endanger the breaking of the surface. Even this will be attended with advantage. It will help to eradicate the heath, moss (or *fog*), and coarse grass, and so increase the quantity and mend the quality of the pasture.

The writer recollects to have observed, above 30 years ago, a striking instance of the effect of watering on the face of a bleak mountain. A green stripe ran a considerable way across a dark heath, with which it formed such a contrast, that he was induced to go to the spot and examine into the cause; and found it had been the lade or tract by which water had been once conducted to a corn-mill. It had been dry, and neglected time out of mind; but the effect of the watering still continued; and the hill was beautified and

Arable land is vastly meliorated by watering; but, if it is not under sward, the water should not run rapidly over it, lest it wash away some of the soil. A field at Lochfanish near Campbelton, which is frequently overflowed in winter, has this year produced the sixth crop of oats running, and it is thought too rank. If the crop is varied, it may need no other manure for ever. An outfield in the farm of Kinchrakin, in Glenurchay, overflowed in the same manner, has had no other manure in the memory of a man past 80; during which time it was under the same management with another which was regularly teathed or manured by the folding of cattle. It is astonishing that art has been so slow in imitating nature.

meliorated for a considerable space below by the water which in the days of yore had overflowed this little channel.

Upon the whole, the advantages of watering are so great and obvious, so well suited to this county, and so easily obtained from the multiplicity and descent of the streams, that there can be no doubt, if the improvement were once generally known, it would be generally practised. To what extent it is capable of being carried in this county it is difficult to say. If in Wiltshire there are near 20,000 acres under the watering system, and 50,000 in Dorsetshire, the greater extent and more numerous streams of this county might admit of a great deal more; and if the value of such ground "may fairly be called three pounds per acre*," how immense upon the whole would be the benefit! Even the poorest hilly ground is capable of wonderful improvement by watering; and the benefit of that improvement is ensured as long as water shall continue to run, and grass to grow. "Watering is beyond a doubt the first and greatest improvement, at the least expence, ever discovered †."

* *Agricultural Report of Wilts.* p. 34. "But taken as a part of a sheep-breeding farm (adds the author), its value is almost beyond computation."

† *Agricultural Report of Worcester.*

CHAPTER XIII.

LIVE STOCK.

SECT. I.—*Cattle.*

BLACK cattle were (till sheep have been lately introduced) the principal export of this county, and the chief care of the farmer was to rear them. They still make the greatest part of the live stock of the lower part of the county, where a great part of the lands is in tillage, and where the hills connected with them are not extensive enough for sheep walks. The cattle are a small hardy breed, generally weighing, when fat, from five to six stone the quarter. Few of them are polled, but the horn is generally small. Gentlemen who have paid attention to breed and rearing, have of late greatly improved both the shape and size of their cattle. These sometimes give from 20 to 30 guineas for a bull, and from 10 to 15 for a handsome breeding cow. Among the ordinary tenants, however, this improvement goes on but slowly. With them milk is the great object; and that is obtained if the cow has got a calf. Their farms, too, are generally overstocked; so that the cattle are at all ages stinted in their food, and prevented from attaining to their proper size. It is to be hoped that the high prices obtained for handsome and well reared cattle will soon lead them to attend more to the breed and to the rearing. When our lands are better cultivated, and green crops introduced, our cattle will be very different from what they are at present, when in winter, especially, they are half-starved on scanty portions of dry straw, or left to their own shift in bleak enclosures.

In the district of Kintyre the cattle are generally less handsome than in other parts of the county; but they give more milk; to which they have a greater aptitude than to fatten. But their giving more milk may not be so much owing to their shape, as to their having less distance to travel for their food, to their being comfortably housed at noon and night, and to their having, on these occasions, a handful of food; which, procured without toil or trouble, is equal to three times as much, when gathered perhaps by travelling two or three miles, and picking it up on bare pastures. A common error in most parts of the county, is to drive the cattle daily over the greatest part of the farm, instead of making them eat it alternately in patches, and giving them clean grass in succession. In this, as in many other respects, enclosures would be of the greatest benefit. The cattle could feed unmolested, and the grass would go a greater length, by being regularly consumed.

Whether a handsome shape, and a disposition to fatten easily, be qualities that are compatible with giving much milk, is doubted by many; though it is probable that, by proper attention and perseverance, all these qualities might be combined. If not, it should be remembered that the handsomest animal is the easiest fed, and that the cows which have less milk, have it of so much better quality, as to make the difference not so great as is commonly imagined. The butter and cheese from thick milk is not only more, but also of a richer quality.

It is not thought advisable to change the breed, or even to cross them with any other, except such as are of the true Highland kind. The most, therefore, that is done in this way, is to bring handsome bulls and cows, sometimes from Sky, Kintail, and Lochaber, to mix with the breed of the county, which are of the same origin; only that on some parts of the coast, particularly in Kintyre, a part of them are

corrupted by a mixture of Irish blood. No breed less hardy than our own would bear to lie out in winter, as is sometimes necessary; and no breed much heavier than our own would fit our rough ground and short pasture. The size of the cattle should always correspond to the ground and pasture, and it is much safer to be under the measure than above it. In any ground or pasture, indeed, it is a question whether the profit upon the smaller be not greater than upon the larger cattle; as the risk is less, and a greater number of them may be maintained. So that in every view it is better to be at pains to improve our own breed than to introduce any other. It is probable that the best of our own breed, if pains were taken to select and rear them properly, might be made the foundation of making the best and most profitable breed for any part of the kingdom; as they are hardy, light in the bone, and easily fattened. These qualities fit them for giving the best return; and that must be the best breed which will pay most from any given spot of ground.

On this subject the opinion of the late Mr. Bakewell, who was undoubtedly the best judge of cattle in the kingdom, ought to be decisive. This gentleman, according to the report of Messrs. Redhead, Laing, and Marshall *, to Sir John Sinclair, signified "that he questioned much if the West Highland Scotch were not the best kind of black cattle." He added, "that, in his opinion, many small are to be preferred to a few large; if the same quantity of pasture or food will pay equally, by feeding the many, as the few †."

* Observations on the Different Breeds of Sheep, &c. p. 36.

† Mr. Abraham Jones, a Norfolk farmer, gives the same opinion respecting the Argyll breed of cattle. He says, "There are several breeds of cattle in Scotland; as the Galloway, the Fife, the Argyll, and the Sky; but, from all the experience I have had, I prefer the Argyll, or West Highland. I consider them to be the most profitable cattle in Great Britain for fattening. If bought at four years old, they both grow in size, and fatten at the same

The reporters add, "The criterion of excellence with Mr. Bakewell seems to be, *what will pay most for the same quantity of food.*" No other criterion will be long regarded by any man of prudence. A gentleman of this county (Mr. Campbell of Barcaldine), by way of experiment on the breed, reared two bullocks to such a size as to fetch 20l. each, at the market; but did not choose to proceed any further in that system.

Those whose object is to rear good cattle, make very little butter and cheese, as they generally rear a calf for every cow, and give it almost all the milk. A bull calf is sometimes allowed the milk of two cows till he is well brought forward. The cows are also allowed to go soon dry, that they may be kept in the better order. The three-year old cattle of gentlemen, reared in this manner, sold last year to English dealers at from 6l. to 7l. *; which is at least a third more than was fetched by the cattle of the ordinary tenants, who take the best share of the milk from the calves, and also pay less attention to their grass. The introduction of winter green food, and the practice of watering would be of vast advantage to the young cattle, and also give a large surplus of milk for the dairy.

"time, and make a very quick return of profit. They are horned, generally black, and weigh, when fattened, about 560 pound (16 ounces to the pound). That medium size is always sure to fetch the best price at market." *Mid-Lothian Report, Appendix N° II.*

"Admiral Keith Stewart lately introduced (into Galloway) a beautiful Argyleshire bull, which he considered to have made the greatest improvement of any on the country breed." *Agr. Rep. of Galloway, p. 22.*

† This year (1796) some parcels of them sold as high as 9l. 15s. In 1797, some fetched from 10l. to 12l.

Before the price of black cattle got up thus high, the Duke of Argyll's Highland bullocks, reared at Inveraray, and sent to fatten for a year in Roseneath, to the number of about 50 annually, were sold to the butchers, when five or six years old, at from 11l. to 13l. per head. *Dumbartonshire Report, p. 60.*

In the district of Kintyre the dairy is more attended to than rearing. The other districts barely serve themselves, but this has yearly a considerable quantity of butter and cheese to spare. The butter is reckoned good, only that as a pound of salt is cheaper than a pound of butter, there is generally a greater quantity of the salt given to the butter than what would serve to cure it*. The cheese is reckoned bad, especially till it is 12 or 18 months old; but almost any cheese requires that age to ripen. What makes it so bad, is, that the milk is generally kept 48 hours to cast cream, and by that time some of it is apt to get sour, and to spoil the cheese, which at any rate must be extremely poor. In other parts of the county, they generally keep the milk but 24 hours, and they make the cheese every day; whereas in Kintyre, in order to make the cheese the larger, they commonly keep the curds of to-day to mix with those of to-morrow, and make only one cheese in the two days. This is apt to make the cheese heave and crack, as one part of the curds will be stiffer and drier than the other.

Most use the upright, but some the barrel-churn. The first is easier kept clean, and can be wrought with a more steady and uniform agitation, which is of great consequence. The butter is commonly made once a-week; though some, who have much milk, make it twice in that time. Perhaps this is as short a time as should be allowed the cream, in order to acquire that degree of acidity which is necessary for converting it to butter. Some mix with the cream the last portion of the milk taken from the cow, which is the thickest, as soon as it is milked. The cream is kept in large earthen dishes,

* The following receipt for salting butter has appeared in several publications. "Take two parts of common salt, one of sugar, and one of saltpetre; beat and blend them well together; and give one ounce of this mixture to sixteen ounces of butter. The butter should not be used for three or four weeks; but it will keep three or four years."

or crocks, till it is ready to be churned; some keep it in a wooden vessel, with a spigot at the bottom, to drain off most of the thin serous part before it is put in the churn. In summer the cream is kept in a cool place, and in winter near the fire, or the vessel in which it is kept is immersed in warm water, to promote acidity, and to facilitate the process of churning. The butter, as soon as gathered, is immersed in cold water (which some think is improper), and then the milk carefully beaten out of it with the hand. Immersing the dish in cold water, if the butter is too soft, and beating out the milk with a wooden paddle would be better, as the warmth of the hand will too much soften the butter. The salt is then thoroughly and minutely mixed, but as already observed, without any fixed rule as to the proper proportion.

The process of cheese-making, as commonly practised in this county, has nothing in it so peculiar as to require a detail. A few have lately begun to imitate the Cheshire, and a few the Stilton mode, which are considered as improvements. But as both modes require the cream to be added to the milk, the farmer who makes for sale is yet doubtful whether any of these modes will turn to more account than his own. To give him an opportunity of trying, the necessary directions for both are here set down. In the first way, the milk of last evening is warmed to the same heat with the milk now taken from the cow, and both mixed together. The cream of last night is also added, after diluting it with a little warm water, to make it mix the better. The rennet is then put in, and the whole well stirred. If colouring is wished for (which it ought not), a little of the infusion of Spanish arnotto, marigold, or carrot, may be added, at the same time with the rennet. If the milk was of the proper warmth (that is, not quite so warm as when taken from the cow), and the proper quantity of rennet given, it will take near an hour and a half to coagulate; unless a little

salt was put in to accelerate the process. If it was too hot, or got too much rennet, it will come too soon, and give less curds, and tough cheese. A cheese-knife of lath, drawn crossways, in all directions from top to bottom, will help to separate the whey; which ought to be perfectly green, when well made. The curds are then broke with the hand, left near half an hour to subside, and the whey then taken off. They are again broke, allowed to subside, and the whey again drained off. After this they are squeezed, broke and rubbed down very fine with the hand, mixed with salt, put in a coarse cloth in the vat; well squeezed; in a little while taken out, wrapped in a dry cloth and inverted in the vat, and again squeezed. The cheese is then put, in a clean cloth, into the press; the cloth changed and the cheese turned within an hour, and again in the evening. After 48 hours it is taken out and put in a salting tub, for two or three days, turning and salting it each day in the cloth, which is twice changed. It is then for seven or eight days placed on a salting bench, where it is turned over and rubbed with a little salt every day. After this it is washed in lukewarm water, dried, and rubbed over with a little fresh butter; and afterwards frequently turned and rubbed with a cloth, in the cheese-room, which should be a place of moderate warmth. A pound of salt is allowed to have been expended on 20 of cheese.

To make cheese in the Stilton way: "Take the night's cream and put it to the morning's milk, with the rennet; when the curd is come, it is not to be broke, as is done with other cheeses; but take it out with a skimming dish altogether, and put it in a sieve to drain gradually; and as it drains, keep gradually pressing it, till it becomes firm and dry; then place it in a wooden hoop; afterwards to be kept dry on boards, turned frequently, with cloth binders round it, which are to be tightened, as occasion requires." Some hang it up in a net, allowing it to drop, and tightening it occasionally as before.

It is to be regretted that the process of making good butter and cheese, which depends on so many minute circumstances, has not been more attended to. Much of the excellence must no doubt depend upon the pasture, and upon the quality of the milk, but perhaps more depends on a proper management. The cattle should not be chafed or overdriven before they are milked, which would give their milk too much agitation; nor should the milk be carried far after it is taken from the cow. The milk should be well drained from the cow, not only because the last drop is the best, but also because if any is left, and that frequently, it has a tendency to put the cow dry. As the first cream which milk throws up is the best, and the last very poor, the butter will be the worse, as well as the cheese, if milk is allowed to lie too long in casting cream. To have both tolerably good, the time should not exceed 18 hours. Much depends on keeping all the vessels clean, sweet, cool, and dry. The milk-house too should be cool and clean, and if a small rivulet were to run through it, it would be so much the better; as this would conduce to cleanliness and circulation of the air. Much also depends on not using the milk any warmer than is necessary to make it coagulate*, and on allowing the curds sufficient time to form. But still more depends on the goodness of the rennet, and on giving the just quantity that will suffice. The most approved method of making rennet is as follows:

“ Take the maw-skin of a calf which has fed entirely upon
 “ milk; after it is cold wash it gently in water, fill it nearly
 “ with salt, and place it on a layer of salt in the bottom of
 “ an earthen mug. One or two more, with salt between,

* When too warm, the oily particles are melted, and go off in the whey. In England they make whey-butter of an inferior quality; which shows, that, in spite of every attention, some of the oil or butter will remain in the whey.

" and a good deal above them, may be put in the same mug,
 " and kept in a cool place, with a slate on the top, for six or
 " eight months, or till cheese-making time next year. The
 " skins are then taken out, and the brine allowed to drain
 " from them; after which they are distended on small hoops
 " or splinters, put crossways within them, till they dry. Put
 " the skins then in an open vessel, with three English pints
 " (or Scotch mutchkins) of pure spring water for each skin.
 " Let them stand 24 hours; after which take them out, and
 " infuse them other 24 hours in other water, but no more
 " than a third of the former quantity. Mix those two infu-
 " sions together*, pass them through a fine linen sieve, and
 " give it salt till the water is more than saturated, and some
 " remain undissolved at the bottom. When any is taken out,
 " the whole should be stirred, the scum from time to time
 " taken off the top; and a little fresh salt added, when it is
 " observed that there is none undissolved at the bottom. Ra-
 " ther less than a gill will serve for 30 lb. of cheese."

* Instead of two infusions, some use only one, giving four-English pints (or one Scotch) to the skin; and direct the water to be first boiled, and mixed with salt into brine that will swim an egg, and then to let the heat go off till it is lukewarm, before the skin is put in for 24 hours to steep.

As it was an old custom in the Highlands to mix aromatic herbs with the rennet, it may be observed, that this has been lately recommended in the Bath Papers. " When the maw-skin is well prepared, two quarts (a Scotch pint) of
 " soft pure water should be mixed with salt, in which should be put sweet-
 " brier, rose-leaves and flowers, cinnamon, mace, cloves, and, in short, almost
 " every spice and aromatic that can be procured: Boil them gently till the li-
 " quor is reduced to three pints (or Scotch mutchkins), taking care it be not
 " smoked; strain it clean from the spices, and when milk-warm, pour it into
 " the maw: a lemon may then be sliced into it, and remain a day or two;
 " after which it should be strained, and put in a bottle well corked; and it
 " will keep good for a year or more. A small quantity of it will turn the
 " milk, and give the cheese a pleasing flavour."

The following Account of the Argyllshire breed of Cattle was drawn up from Notes furnished to the President of the Board of Agriculture, by D. Campbell, Esq; of Combie, in answer to Printed Queries.

THE most profitable breed of cattle, and that which is found to be best suited for Argyllshire is the true West Highland breed. It was for some time considered as an improvement upon this breed to cross it with cattle brought from Sky. But from superior breeding, and greater attention in rearing, the native breed of Argyllshire is now of a much greater size than that of Sky.

Crossing the true Highland breed with any other ought to be avoided; as it is found, from experience, that the native breed is spoiled by it; for, though they do not degenerate in size by this management, they degenerate in the quality of the beef, and in feeding true. The native breed are always the hardiest cattle, and the best feeders.

Some Galloway cattle have been introduced, and found to answer pretty well; but they are not equal to the native breed. Crossing the native with the Galloway breed has also been practised; but the true native breed was found to be superior to this cross-breed, and always preferred to any other by the English buyers, as they fatten quicker and truer.

The form most wished for is, to get them short in the legs, round in the body, straight in the back, and long in the snout. They are of various colours, black, dun, branded, and brown; but the black is the most common, and the most run upon.

When in good condition, and from three to four years old, when they are commonly sold off, the carcase may weigh from 360 to 400 lb. avoirdupois. But such as are brought to better pasture, as in England, may be brought to weigh 560

lb. or more. The price is generally according to the size and shape, but occasionally varies according to the demand.

They are not wrought, nor supposed to be well calculated for working, as they are too light for that purpose.

It is the general opinion that it is proper to change the bull every third year; as bulling his own offspring is thought to degenerate the breed. Bulls are therefore commonly disposed of at the age of six, though they retain their vigour till they are ten years old. No person wishes to have more of these animals than is necessary to serve his fold of cows. Premiums given to those who have the best bulls, has been found to be the best method of encouraging particular breeds.

The best breeds of cattle in Argyllshire are in the districts of Argyll, Lorn,Islay, Colonsa, and Mull; and the Duke of Argyll, Mr. Campbell of Kilmartin, Mr. Campbell of Shawfield, Mr. Macneil of Oronsa, Mr. Campbell of Deg-nish, and Mr. Macdougall of Ardintraive, are the most celebrated breeders. Indeed, it is now become a matter of competition who shall rear the highest; so that the breed of cattle is daily improving in shape and size.

The handfomest cows of the native breed, and such as have the strongest bone, do not give much milk, but what they have is very rich. Rearing is more attended to than the dairy in every part of the county, excepting the district of Kintyre, where the making of butter and cheese has generally got the preference.

Cows commonly calve in March and April. No calves are reared without getting milk. They are almost all allowed to suck the cows; which is thought preferable to what is called rearing by the dish. They are weaned at six months old, and for the last eight days, are allowed to suck their dams only once a-day, till the cows dry up. They are then separated and put into hay foggage, or some other rich pasture.

Dairy cows and fattening cows are fed in the best low lands

in summer, and housed in winter; when they are fed on straw first, and then on hay; and in the spring they get some corn and potatoes, if they require it. The young cattle are fed on the hills during summer and harvest, and brought to the low grounds in winter, and occasionally fed with straw and hay, if necessary: but if the pasture is good, which is commonly the case, they seldom require any hand-feeding in winter.

Yards or sheds are not much used. The housed cattle are kept in close houses. Great attention is given to keep them clean; and it were to be wished that care was taken to preserve their now neglected urine, which would be a very great addition to the manure.

The keeping of all housed cattle cool rather than hot, is thought an advantage; and they feed better and quicker if care is always taken to keep them clean and dry.

As our folds of rearing cattle are throng, and must be gathered morning and evening, the size of our enclosures for such stock must be from 20 to 30 acres: but for fatting cattle, enclosures of from 5 to 10 acres are perhaps the best.

True Highland bred cows ought never to be kept after they are nine years old; as after that age they fall off in value, and do not feed so true. Indeed the English buyers do not wish them older than six at most; and they buy heifers of three, four, or five years old, much higher, in proportion to their weight, than cows of the same breed that are more advanced in age.

The distempers to which Highland cattle are most liable, are black spall, bloody water, flux, and picking calf. A cure for the black spall and *picking* calf is much wanted*.

* The writer of the Report has omitted to say any thing of the diseases of cattle, as he did not hear of any thing that looked like a rational cure, and did not choose to relate idle and superstitious practices. One gentleman of

considerable experience in rearing, says, he has been in use of keeping one or two swine to pasture with his cattle, which he thought a sure preventative of the *black spall*. Perhaps the swine eat up some noxious plants that might be fatal to the cows. But on this point some further experience must decide.

In the *Effex Report* (p. 127-), "Bleeding, when the cows are from one third to half gone with calf, is earnestly recommended as a preventative against premature calving; and when the accident does happen, to bury the abortion immediately, and to keep the cow as widely apart as possible from the herd: To be particularly careful that she does not receive the bull that herds with the cows; at least not till after such a lapse of time as, with good reason, she may be thought completely recovered, and free from the possibility of communicating the smallest infection."

"For the disease called the *red water*, or bloody urine, bleeding and change of food have been in many parts found effectually to answer."

"In the *Chester Report*, it is said, "A handful of salt, and a handful of oatmeal, after being fried in a pan till black, are given in a quart (*chopin*) of cold butter milk; the beast being kept from food some little time before. This, once or twice given, is said to remove the complaint, if not too long neglected. Should the cow be bound, as sometimes happens after the medicine, stiff oatmeal gruel, two quarts (a Scotch pint) at a time, should be given twice or thrice a-day till the complaint is removed."

"For *scouring in calves*, milk and water thickened with bean or wheat flour is given for their food till the scouring is removed, or one or two half pint (Scotch half-mutchkin) drenches of rennet." *Ibid.*

"When the teat cracks, and the bag becomes hard and inflamed, with swelling in the udder (called the *gargle*), the cow should be blooded, her udder well washed and anointed with hogs-lard, or sweat oil, or other ointment. Some recommend washing with butter-milk and salt, or salt and water."

Effex and Chester Reports.

For *swelling in clover*, some recommend two ounces of Castile soap, and some an egg-shell full of tar, to prevent the necessity of tapping; and some recommend (what promises to be more effectual), to thrust down a hollow cane four or five feet long, with a syringe in it, to extract the air and remove any obstruction at the mouth of the maw.

When a potato or turnip sticks in the throat, it may be thrust down with a staff, or any smooth stick.

Account of the Expence of Rearing a Highland Stot in Argyllshire.

To milk to the calf while sucking, a Scotch pint	
per day for six months, at 1d per pint *,	L. 0 15 2
To expence of keeping the calf housed and fed on	
straw and hay during the first winter, 12s. but	
deducting 3s. for manure, remains,	- 0 9 0
To pasture next summer on hill-grass,	- 0 7 6
To keeping next winter on low grounds, and fed	
in the fields with hay when necessary,	- 0 10 0
To pasture on hilly ground next summer, being	
then two and 1-half years old,	- 0 7 6
	L. 2 9 2

Our best breed of cattle in Argyllshire, of the above age and feeding, sold this year (1796) at 8l. per head. Deduct for risk one in 20 (each year of the two and 1-half), or an eighth part, there remain 7l.; from which deduct the expence as above, and there remain 4l. 10s. 10d. of profit to the rearer, burdened with the interest of the money in stock. But as cattle sold remarkably high this year, the ordinary profit may be stated at 3l. 10l. 10d. and that of the cattle of small tenants only at 2l. 10s. 10d.

Some winter their calves in open sheds, where they are fed with hay in racks, and have the liberty of going out and in at pleasure. This makes the cattle hardier and truer feeders. The feeding of young cattle with turnip, &c. is not yet practised. But the feeding of milk cows in spring with potatoes, along with straw and hay, is a frequent practice. The potatoes are given raw or boiled as most convenient.

The fattening of hogs with boiled potatoes is also practised,

* It is thought the allowance made by Mr. Campbell (a chopin each end of the day) is too small, at least by one half; and the price put upon the milk is but one half of what it draws when it is sold, which must greatly reduce the profit below what is above stated.

and found to answer well, with the addition of meal or corn for the last fortnight before they are killed. It is of consequence to give them always a dry and clean bed ; for cleanliness is very material in feeding all animals.

SECT II.—*Sheep.*

THIS useful animal was, till very lately, much neglected in this county. Few wished to have any more sheep than what was requisite for their own domestic use. There was little demand for wool or mutton from other quarters, and very little to spare if there had. The few sheep which we had were under the most barbarous management. Their pasture was poor, and often at a great distance. They were folded in summer and harvest, and housed in winter and spring. No attention was paid to the change or choice of rams, and they were often left to their own discretion as to the season of breeding. The consequence was, that the lambs came before the grass, and of course they were all stunted, and many of them starved. From the middle of May the lambs were deprived of half the milk, by separating them at night from their dams, which were milked in the morning. About the end of June the lambs were weaned ; and the manner of doing it was sometimes by tying a small stick across in their mouth, which not only prevented them from suckling, but even from pasturing with any tolerable ease. After this the ewes continued to be milked evening and morning till some time in September. It is unnecessary to add that the flock did not thrive. It is rather a wonder that the species did not become altogether extinct. Nothing but their remarkable hardiness could save them from utter perdition under such wretched management. They became, however, small and ill shaped ; but, in general, they still retained a fine pile of wool. The breed was white-faced, some of them orange-faced ; *

few of them polled *, but generally horned. Many of them were black and gray, which were more favourite colours than white, as they saved the trouble of dyeing the wool. The fleece, like the carcase, was small; but fine, close, and matted.

Between 30 and 40 years ago, a different breed, and a different system, were introduced into the county, and since extended by degrees over a considerable part of it. Storemasters from the south country who first began the business, brought their own sheep, the Linton or black-faced kind, along with them. The natives soon perceived that more profit was to be derived from sheep than from black cattle, in such a hilly country as this, and numbers followed their example, and went to the same market for their sheep. There was indeed a necessity for going out of the county for sheep, as it would be difficult to collect at once as many of the native breed as would stock a large farm. But the great mistake was not to introduce a better breed than the Linton or black-faced kind. This kind is indeed hardy, and well adapted to a mountainous country; but their wool is coarse, loose, and shaggy; and they are subject to a very fatal disease, the *braxy*, which before the introduction of these sheep was totally unknown in the Highlands.

There can be no doubt but the native breed, if properly attended to (and it is not too late to do it yet), would prove a much more valuable stock than the black-faced kind. If equal justice were done them, they might probably be brought to an equal size. If not, the same ground would maintain so much the greater number, and so compensate for what they might want in size. A very intelligent storemaster told the writer that he had a few of white-faced wedders among

* All sheep are the better of being polled, as the horns are useless to a domesticated animal, and deprive the carcase of part of its nourishment.

his flock, and that when at any time he wanted a very fat mutton, his general rule was to take any one of these. Another told him that he had been for some years before he got a sheep stock, in the use of buying up some of these small wedders at 5s. or 6s. a piece, and keeping them a year in a small island where they had excellent grass, and then selling them fat, at 13s. or 14s. a head. With equal justice, then, it is probable, that in a short time the carcase might be brought to be of equal value with that of the Linton; and it is certain the wool would be of much greater. Within these few years it has been frequently sold for 16s. the stone, when the other wool sold for 7s. or 8s.*. The native sheep are supposed to be equally hardy, and their fleece is a warmer covering; and should agriculture be more attended to than it is, no kind of sheep will better bear to be folded. Their being less subject to diseases, particularly the fatal one already mentioned, is a prodigious advantage. Upon the whole, there is every reason to cherish this breed, which has been for ages naturalized to the soil and climate. If any one would take the trouble to collect what would stock a farm of them, and pay them proper attention, he would in a few years have an immense advantage over those who have the other kind. If the native breed shall continue to be neglected till they become altogether extinct, the loss may be regretted when it cannot be repaired. This subject deserves the serious and immediate regard of every

* A sheep stock of the Linton breed, on the Mull of Kintyre, was mixed about 20 years ago with considerable parcels of the old Highland breed. The cross breed, between the black-faced rams and white-faced ewes, answered well. The size was not sensibly diminished, and the wool was much improved, and still continues to be much finer than that of any other sheep stock in the county.

land-owner, who wishes to promote his own interest or that of the county in general *.

But if we will have a foreign breed, why not take the best, when equally well adapted to the soil and climate? The Cheviot sheep are in every respect superior to the black-faced kind, and found to be equally fit for a mountainous situation. They are hardy, fine-woolled, and well-shaped. They are long-bodied, and long-limbed, which fits them for climbing steep mountains, and for travelling, either for seeking their food, or going to a distant market. Their fleece too is finer, closer, and warmer. They have every property that should be sought in a mountain sheep, and accordingly they have been found to thrive in every part of the Highlands in which they have been tried; and are said to be less subject to diseases than the black-faced kind. Some of them have been lately introduced into this county by the Duke of Argyll, and by Mr. Campbell of Auch, in the highest parts of Glenurchay, and found to answer exceeding well †. Indeed no part of this county is more inclement than that from which they came ‡, where the hills are sometimes covered with snow for three or four months in a year, and where many of the lower walks consist of peat bogs and

* The writer, however, thinks it his duty to mention, that on this subject he has found sheep-masters differ much in their opinion; though all agreed as to the propriety of making a few fair trials.

† Lord Breadalbine, a few years ago, made a present of some Cheviot wethers to several of his tenants in Glenurchay, in order to try how they would fare on the same pasture with the black-faced kind, and the writer was informed by some of the storemasters that they perceived no difference in their thriving.

‡ In 1784, the sheep in Cheviot were fed for 14 or 15 weeks with hay. No such storms are ever known in this county.

deep moraffes ; so that with us their situation would be mended ; a circumstance which will always ensure success*.

It is difficult for those who have already got another kind to change the breed ; but new beginners ought undoubtedly to stock with the Cheviot kind. It is said that the Yorkshire graziers have a prejudice against this kind ; probably because they would then have more rivals in the trade, which is now in few hands ; as the carcase, and not the wool, is the principal object of attention. Whatever may be in this, the introduction of the Cheviot, which would treble the price of wool, would more than balance it †.

* The following experiment, made in the parish of Barr, in Ayrshire, may show the comparative hardiness and value of the Cheviot breed. " In June 1792, a ram, and two score of ewe hogs of the Cheviot breed, were put upon one of the highest and coldest farms in the parish. The harvest was wet, the winter and spring stormy, and the loss of the native sheep, through poverty and disease, was considerable. Yet all these, though strangers, and in such a situation, did well. The wool of the native sheep, taking 10 fleeces to the stone (24 lb.), sold at 7s. 6d.; the wool of the Cheviot kind, taking only 7 1-half to the stone, sold at 15s. The profit here was great; but how much more, if the wool had fetched its real value of 20s. the stone?" *Stat. Acc.* XII. 85.

In 1792, the Cheviot wool sold from 18s. to 20s. the smeared, and from 20s. to 22s. the white; from six to eight fleeces of the first, and from eight to nine of the last, going to the stone. Some went as high as 23s.; and it is thought it will soon be improved so as to fetch 30s. if not 40s. Draft ewes sold from 12s. to 16s.; and three years' old wedders from 18s. to 22s. In Etterick, Ewesdale, and Liddesdale, they are now converting their flocks as quickly as possible into the Cheviot breed. *Observations on different Breeds of Sheep*, p. 66.

Liddesdale is the worst district, yet the Cheviot breed thrive in it. *Roxburgh Rep.* p. 58.

† Even they who have another stock, and cannot conveniently change it, might at least cross it with the Cheviot breed, which might be done with little trouble, and to great advantage. " In the years 1787, 1788, and 1789, an intelligent farmer in the parish of Moffat put Cheviot rams to his black-faced ewes. In 1790, he sold the wool of the sheep produced by that cross " at 10s. the six fleeces; and the wool of his other stock of the black-faced

The only way in which the rents of the landlord, or the profits of the farmer, can be further advanced, on many of the sheep-lands in this county, is, by changing the breed, and improving the wool; and both are interested in making this the immediate object of their attention. Mr. Richardson, who, in 1792, at the desire of the British Wool Society, travelled through the Highlands, after observing that it is *an absurd and ridiculous idea, too generally entertained, that the Cheviot breed could not thrive in the Highlands of Scotland*, remarks, of some of the storemasters of this county in particular, That “they seem disposed to try to what perfection they can bring the black-faced breed, without calculating the enormous loss they will sustain in the mean time, by persevering in so unprofitable an experiment.” The calculation may be easily made, and may be fairly stated at 20d. the fleece, which is the least that the wool, by a change of breed, might be improved*.

“kind, which went exactly on the same pasture, only at 6s. 3d. the seven fleeces. The sheep thus produced were as healthy as his other sheep, the carcase not materially altered, and the weight of the wool increased a seventh part, and its price more than a third. The farm on which they were, is as high ground as almost any in Scotland.” *Stat. Acc.* II. 292.

* The greatest improvement in the wool may probably be expected from the Spanish breed, as will appear from the following extract from the Statistical Account of the Parish of Strathblane.

“A. Edmonstone, an extensive grazier, has lately introduced a few sheep of the true Spanish breed into his farm. The only hazard of which he was apprehensive, was, that the inclemency of the weather in winter would hurt them. Of this apprehension he has been most happily relieved. They have already stood two winters as well as the rest of his flock; and one of them was the most severe that has been known for many seasons. The only precaution which he used, was to keep them on his low grounds during winter; but in summer they are fond of feeding on the tops of the hills, and thrive there as well as the native breed. Their lambs are equally hardy as themselves, and promise to become a great acquisition to the country; the wool being much superior to any ever known in this place. Each ewe pro-

But, after having thus observed the decided advantage of the Cheviot over the Linton breed, we must still add, that there is much reason to believe it would be wiser to cherish our own breed than either of them. What improvement they are capable of, has never been fairly tried. This might be done at little expence, by collecting some of the best rams and ewes, and judiciously crossing them with others of the same kind, whose shape, size, or wool, &c. may have those qualities which the breeder most desires to alter or correct in those he has. After taking all possible care, there is great risk in changing the breed of sheep or cattle from one country to another, where the air, climate, or food, in any material degree, differ. The new and formerly unknown diseases introduced already into the county by a foreign breed, is a sufficient proof of this. We run no such risk in the improvement of our own, which cannot be too earnestly recommended, before it is too late. Should they be collected, improved, and propagated with sufficient care, they might in time banish the foreign coarse-woolled breed, and their diseases with them. Of all the modes of improving the breed of sheep, which have been suggested by such as have attended to the subject, this is certainly the safest and most rational, where the breed has no material defect; and it has succeeded the best of any, where it has been fairly tried. This will appear from the following extract from the Agricultural Report of Merionethshire: "The breed of sheep in this county is the

"duced 4lb. and the ram 5lb. which brought 3s. 6d. *per* pound; and was, even at that price, sold much under value.

"Last year he crossed the breed with the Spanish ram and Scotch ewes; and also with a Scotch ram and the Spanish ewes; and this experiment has succeeded beyond expectation. The lambs thus generated, have wool little or nothing inferior to the old Spanish sheep; and they may be expected to be even harder than these, as being inured to the climate from their birth."

Stat. Acc. XVIII. 571.

“ most pure of any in North Wales, and is likely to conti-
 “ nue so, from an apprehension of the scab, foot-rot, and
 “ other disorders being introduced by crossing with other
 “ breeds; which is the case in Anglesea and Caernarvon-
 “ shire, but which Merionethshire is unacquainted with. No
 “ attempt has been made to improve it, except sending for a
 “ ram to Tallylyn (at the foot of Kader-Idris, the highest
 “ mountain in Merionethshire), where the best breed in
 “ North Wales is to be found. They are much longer bo-
 “ died than the common breed. Mr. Corbet (one of the first
 “ improvers in North Wales) has invariably followed this
 “ plan; by which means he has so considerably improved
 “ his stock, that he sold his wedders this year (1794) for 19s.
 “ a head, when the common price was only 13s. for well fed
 “ wedders. The average weight is 10lb. the quarter; the
 “ fleece 2lb. at 1s. *per* pound. The sheep are always kept in
 “ the mountains, except the ewes, which are brought down
 “ at the lambing season, in March and April. The practice
 “ of laying sheep with tar is altogether unknown in this
 “ county, nor is the want of it felt as an inconvenience,
 “ though the climate is as cold, and the storms as boisterous,
 “ as in any part of Scotland.” Our native breed seem to be
 much the same with those of North Wales; and, by the same
 management, might be brought to the same perfection*.
 The farmer who should begin such a system, would merit
 every encouragement from the county.

The mode of managing sheep stocks in this county is, in
 general, the same as in the south country, from which the
 stock and the art were both introduced. The following are
 the main points attended to by the most skilful storemasters:
 To stock lightly, which will mend the size of the sheep, with

* The best of the North Wales breed would, probably, suit this county
 well, and be a valuable acquisition; as they are already improved to the state
 to which the same kind with us cannot be brought for many years.

the quantity and quality of the wool; and also render them less subject to diseases*.—To select the best lambs, and such as have the finest, closest, and whitest wool, for tups and breeding ewes, and to cut and spay the worst.—To get a change of rams frequently, and of breeding ewes occasionally.—To put the best tups to the best ewes, which is considered as necessary for bringing any breed to perfection.—Not to tup their year-old ewes †; which, in bad seasons especially, would render the lambs produced by them of little value, as the ewes would not have a sufficiency of milk; and would also tend to lessen the size of the stock.—To keep no rams above three, or at most four years old, nor any breeding ewes above five, or six.—To separate the rams from the 10th of October, for a month or six weeks, to prevent the lambs from coming too early in spring.—To separate the lambs between the 15th and 25th of June; to have good grass prepared for them; and, if they can, to keep them separate, and on good grass, all winter; that they may be better attended to, and have the better chance of avoiding diseases. A few, whose possessions enable them to do it, keep not only their lambs or hogs, but also their wedders, ewes, &c. in separate *hirsels*; by which every shepherd, having his own charge, can attend to it better than if all were in common; and each kind have the pasture that best suits it ‡. But all are negligent in rais-

* In all these respects, it is allowed by good judges, that 500 kept well, will return more profit than 600 kept indifferently.

† The names of sheep are:—

1st, Ewe, wedder, tup-lambs till they are smeread.

2d, Ewe, wedder, tup-hogs till they are shorn.

3d, Gimmers, dimmonds, tups till they are shorn again.

4th, Old ewes, wedders, tups afterwards.

Stat. Acc. of Linton.

‡ In Linton, the following management is observed: "In summer the flock is divided into three *hirsels*. In the first are all the hogs and yield sheep; in the second, the milk ewes; in the third, the lambs. In winter they are kept only in two *hirsels*. In the one are the hogs, in the other the ewes

sing artificial grasses, or a supply of green food for the sheep in winter; which, indeed, could only be done by some, as the lands of others would not admit it.

Smearing or salving the sheep with tar and butter in October, is a general practice; but some smear more than others, according to the difference of situations. All smear the lambs and tups, and some smear all except the old wedders. The purpose of it is to defend from the cold, scab, and vermin; and to increase the quantity, and mend the quality of the wool. Different people mix the ingredients in different proportions. From three to four pounds (English) of butter, and one Scotch pint of tar *, is considered as a proper allowance for 9 or 10 sheep. The more butter, and the less tar, the more the wool will be meliorated. Mr. Richardson (for-

"and yield sheep. The lambs are weaned about the end of June, the ewes milked from the 1st of July to the middle of August, and the milk made into cheese. The sheep are clipped from the end of June to the end of July, according to the weather and condition of the flock. The tups are kept to the ewes from the 15th to the end of November, according to the situation of the ground, and the nature of the grass. From 40 to 50 ewes are allowed to one tup. The breeding stock is changed every five years, by selling off the superannuated ewes. Some ewes, however, are kept longer than five years, and some shorter, according to their condition; for they do not all decline equally soon." *Tweeddale Report.*

* Many in this county allow only two pounds of butter to the pint of tar; or a stone of 24lb. to the 12 pints; which is very hurtful to the wool. The most approved mixture is, three 1-half pounds (English) of butter to the Scotch pint of tar (*Roxburgh Rep.*). The better the butter is, the farther it will go. The best tar is that which appears yellowish, and rises when rubbed against a board with the finger, as this washes better out of the wool.—It is found, that "two pints of butter-milk added to six Scotch pints of tar, and its proportion of butter, will smear four sheep more than the same quantity of tar and butter will do by themselves. If the butter-milk be a week or two old, it is so much the better. It makes the tar and butter incorporate more closely, renders the salve firm, and draws much finer upon the sheep than without it. The salve thus prepared is fit for immediate use." *Stat. Acc.* XVII. 571.

merly mentioned) says, that "there is reason to believe that "a mixture of tobacco liquor and spirit of turpentine, with "a little brimstone, answers fully as well as tar and butter, "for the great object of smearing; which is, that of killing "the vermin, and preventing the scab." Something similar to this "is practised in the parish of Lochlee in Angus." The lambs are smeared in autumn with tobacco juice, mixed with black soap and a little stale urine; allowing about four pounds of soap to twenty pints of tobacco juice*. As tar is not easily procured sometimes, it may be of consequence to the farmer to know, that such things may be used, at least as substitutes. Train oil may also be used as a substitute for butter; but the butter, when it can be got, is better.

Smearing or salving is thought here to be of absolute necessity, and yet it may perhaps be doubted whether it might not be dispensed with, or at least managed in an easier way. In Wales this practice is unknown, though the country is colder than most of this. In Northumberland, where it had been long used, "it is now given up as useless." In some parts of the county of Wigton, it is also "falling into disuse;" and is "not found necessary" in some sheep districts in Clackmannanshire†. Our storemasters, however, speak of its utility with confidence; founded, they say, upon experience. If this be well ascertained, it would be improper to give up the practice. But even on the supposition that it ought to be continued, some think that the operation might be performed when the sheep are shorn (which would be attended with much less expence and trouble), with butter or oil, and a decoction of tobacco juice, oak bark, or broom, without any mixture of tar, so hurtful to the wool. This decoction

* *Stat. Acc.* V. 364.

† *Agricul. Report of Northumb.* *Stat. Acc.* Vol. XVII. p. 586. *Agr. Rep. of Clackmannan.*

would kill the vermin, or their eggs, and the butter or oil would improve the wool *, the natural and sufficient clothing of the animal. If the practice cannot be given up now, it probably may hereafter, when the breed is more naturalized to our climate.

The principal disease to which sheep are subject in this county, is that which is called the *braxy*, introduced by the Linton. It generally attacks the hogs in the end of autumn (but on some farms not till the end of winter) †; and it no

* Columella and Celsus anciently prescribed oil for improving the wool. A few years ago a farmer in Selkirkshire, being unsuccessful in the competition for the premium granted for the best wool, smeared next season with butter only, without tar, and easily gained the premium. This experienced farmer thinks tar of no use, but to kill vermin; which may be effected with other materials, that will not hurt the wool. See *Stat. Acc. (of Linton)*, l. 135.

The following *recipe* has been published, for killing vermin, and preventing the scab:—"Boil up two pounds of the strongest tobacco, with a sufficient quantity of salt water or urine; add one gallon of train oil, and two gallons of butter-milk, which will serve for 100 sheep. Rub each sheep with it all over, especially along the back-bone, as soon as shorn. This will also keep away the flies, throw off the wet, and encourage the growth of the wool." *Glasg. Cour. Ap.* 1796.

The following method may also be used for marking sheep without the use of tar, or hurting the wool.

Put as much linseed oil to a pound of printers ink as will, when well worked together, bring it to about the same degree of thickness as house-painters mix their paint. When the sheep are shorn, make a large Roman letter over the sheep's back with a stiff half-inch brush, drawing it several times both ways, so as to work the colour through the wool to the skin." *Scots Mag.* Vol. XXXV. p. 20.

Dr. Lewis (Com. Phil. Techn. p. 361) recommends, for marking, melted tallow, with so much charcoal, in fine powder, stirred into it as is sufficient to make it of a full black colour, and of a thick consistence. This will bear the changes of weather, and not injure the wool. To make it still more durable, a sixth or eighth of its weight of tar might be mixed with the tallow; which will readily wash with it out of the wool.

† Hence a change of pasture, which, in Tweeddale, is considered as "the only remedy for this disease," may be found to be beneficial. *Agr. Rep. of Tweeddale*, p. 34.

sooner attacks, than it kills. Sometimes a third, sometimes a fourth part of them die of this disease, and seldom less than a sixth or seventh. As it admits of no cure, it is fortunate that we are assured it admits of a preventative. Mr. George Culley of Northumberland, so well known for his skill, and for his breed of sheep, makes the following very valuable observations on the margin of Mr. Robson's report of this county: "What is here called the *braxy*, goes by the name of the "*midden-ill* in Northumberland, and in different parts of "England is called the *red-water*, and *black-water*. In my "memory we never lost fewer than one in 8 or 10. Now we "seldom lose one in 100. And this is prevented, not cured, "by supporting the hogs, in autumn, better than formerly, "by putting them upon feeds, &c. (artificial grasses), soon "after being weaned, and then early to turnips, rape, &c. * "Raising them early, and driving them about with a dog, "was much in use formerly; and many nostrums were pre- "scribed and given. But nothing was effectual, until we "were advised, by Mr. Bakewell, to maintain them well at "the above season, which has answered the end. It is evi- "dent that they are in a sinking state, when they die; and "it is remarkable, that the best hogs fall in general. And "unless the Highland flockmasters can find means to keep "up the condition of their hogs by turnips, rape-seeds †, &c. "they must submit to lose numbers by this fatal disorder. "Hogs are most liable to it; though sometimes sheep a year "older die of it. But I never knew a sheep die of it after

* In the Highlands our possessions are generally so large, and disproportioned to the quantity of arable land, that the above direction can hardly be followed much, without reducing the size of sheep tenements, and putting them into more hands.

† Rape or cole seed is sown, on ground well prepared, in the month of June; about 1-eighth of a bushel of seed to an English acre. In England this is a common winter and spring food for sheep.

"two years old, and very few of that age. In large flocks, a cart-load, for many mornings in succession, in the latter end of October and beginning of November, was not uncommon to be brought home dead. It was common in every part of England, until it was prevented by better food. From near 40 years experience, I have found this as near infallible as may be." He adds, in another note, "I will be bound for it, that better keeping will prevent the *braxy*, as they call it."

It is to be hoped that this may help to induce our storemasters to cultivate their fields now neglected, and to raise artificial grasses and green crops. This would be attended with great advantage, if there were no such necessity for it, as the preventing of this fatal disorder. The way to turn land to most account, even for grazing, is to bring it occasionally under the plough. Besides the profit to themselves, this would also give employment to the labouring poor, and help to make their interest compatible with that of the storemasters. The watering of meadows and other pasture grounds, together with attention to tillage, would be an effectual way of increasing green food, and plenty of it, and consequently of preventing the ravages of the *braxy**. Artificial food will also increase the size and number of the sheep, and add to the quantity and quality of the wool.

The *scab* is another disease incident to sheep, especially when brought from rich to poor pasture, for which Mr Robson prescribes as follows: "To cure this disease in a score of sheep, and so in proportion to any other number, take a pound of tobacco leaves, with as much water as will completely cover them; boil this thoroughly, and squeeze the

* "Turnips have been found a preventative of the braxy." *Stat. Act. of Selkirk*, II. 440. "Turnips or clover stubble is said to prevent it." *Stat. Acc. of Linton*, I. 133.

“ juice out of the tobacco leaves ; then mix this decoction
 “ with about ten Scotch pints of chamber-lye, and with this
 “ bathe the sheep, as in smearing ; only as the liquid is thin,
 “ the wool must be shaded and held up, so as to prevent its
 “ running off. Begin first by shading the back, then the
 “ sides, and lastly the belly ; by which means, with a little at-
 “ tention to the parts below the legs, every part of the body
 “ will be touched with the mixture.”

On this Mr. Culley notes, that, “ if three spoonfuls of oil
 “ of turpentine be added to every bottle-full of the tobacco
 “ liquor, put on with a quill through the cork (always taking
 “ care to shake the liquid well every time it is poured on
 “ to prevent the turpentine, which will be uppermost, from
 “ coming off first), it will effectually cure it. Or Sir Joseph
 “ Banks’s recipe will answer well.”

As Sir Joseph Banks’s receipt has been found effectual by
 some who tried almost every other in vain, it is here added.
 “ Take one pound quicksilver, two pounds hog-lard ; half
 “ a pound Venice turpentine, half a pound oil, or spirit of
 “ ditto ; the whole to be beat, wrought, and mixed together
 “ till made into an ointment ; the parts affected to be rubbed
 “ with a small bit, about, or less than a hazle nut. To pre-
 “ vent a flock of sheep from being infected, rub a few sheep
 “ by laying the ointment on in a stripe from the neck down
 “ the back to the rump, a stripe down each shoulder, and
 “ down each hip.”

Fags, or *kades*, are destroyed by a mixture of soap and
 mercury : *Ticks*, by a decoction of tobacco, broom, oak-bark,
 or mercurial ointment : The *foot-rot*, by caustics ; but as
 it is little known here, it is almost unnecessary to give par-
 ticular prescriptions. The root of the disorder is pared away,
 and the part once or twice anointed with oil of vitriol and
 spirit of turpentine.

The following statements are taken from Mr. Robson's Agricultural Report of this county.

“ Stocking a sheep farm with that number which requires one good shepherd, stating the capital employed, and the average expences and losses incurred, I next consider to be my duty: In attempting which I am well aware that it will expose me to much censure, not only from such proprietors as may have screwed their rents too high, but also from such tenants as have cheap bargains; yet as I think a fair statement ought to satisfy, and may be of service to both parties, I will venture to give an opinion respecting the general system of a sheep-stock, in the average situation of Highland grazings; leaving it to those who are particularly placed, in point of advantages or disadvantages, to add or deduct accordingly.

“ Graziers in Highland districts may, as circumstances dictate, either turn their views to the advantage arising from a breeding stock, where the lambs are the principal object of sale, or to a rearing stock, where the wedders are looked up to as the principal source of profit. But it may not be improper to observe, that a grazier, in choosing between these stocks, ought to prefer the wedder system, where the grazing is high, cold, and destitute of good spring resources for the ewes either at or after lambing time.

“ In the district which I have surveyed, 600 sheep are in general considered a sufficient charge for one shepherd. Taking then this number as the average proper charge of a shepherd, if kept as a breeding stock, they ought to be divided as follows:

Breeding Stock.

" 14 tups,	} at 14l. the score; hence	L. 296 16 0
" 410 milk ewes,		
" 50 gelt ewes, &	} at 9s. 6d. each, 1 to the score,	79 12 4½
" 126 ewe hogs,		
" 600	Total Value,	L. 376 8 4½

Annual Sales, &c.

" 53 shot lambs, 50 only payable, at 3s. each,	L. 7 10 0
" 189 lambs, at 5s. each, one to the score,	45 0 0
" 84 old ewes, at 6s. 6d. each, one to the score,	26 0 0
" 21 gelt (yield) ewes, at 9s. 6d. each, one to the	
" score,	9 10 0
" 4 aged tups, at 10s. each,	2 0 0
	L. 90 0 0
" 460 white fleeces, at 10d. each,	19 3 4
" 140 laid or smeared fleeces, at 10d. each.	5 16 8
	L. 115 0 0

Charges and Expenses.

" Call the capital employed in stock, for ease of calculation, 376l. 10s. This, on account of extraordinary loss	
" that may happen, and bad payments, state at 37l. 13s. being 10 per cent. on the capital employed.	
" To interest of capital, at 10 per cent.	L. 37 13 0
" To 8 bolls meal to the shepherd, at 16s. per	
" boll; one 1-half boll of this being allowed	
" for dogs,	6 8 0
" To laying with butter and tar 168 lambs,	
" and 14 tups, labour included, at 4d each,	3 0 8
" Gatherings, clippings, luck-pennies, &c.	5 0 0
	L. 52 1 8

" No allowance is made for the shepherd's wages, because
 " on a grazing where it is intended to put 600 sheep,
 " is supposed that the shepherd can have the keep of 60
 " more in lieu of wages."

" Amount of sales, as above,	-	L. 115	0	0
" Charges and expences, ditto,	-	52	1	8
" Remains for rent *,		L. 62	18	4

" This rent amounts to about 2s. per sheep, and the wool
 " is valued nearly at the rate of 7s. per stone, tron weight, for
 " white wool, and the laid wool at 5s. ditto, one pound to
 " the stone of each."

Wedder Stock.

" For the sake of a practical view of this kind of stock,

* Mr. Robson should have added, *and for profit*; for which there certainly ought to be some allowance, which would bring the rent lower than is here stated. In the *Stat. Acc. of the Parish of Luss*, the following statement is given of a stock of the same number :

" A breeding stock of 600 sheep, for taking care of which one good shepherd is reckoned sufficient, commonly consists, at Whitfunday, of the following proportions :

" Breeding wets,	-	-	-	-	-	500
" Year-old ewes, for supplying the place of older ewes,	-	-	-	-	-	80
" Tups,	-	-	-	-	-	20
						600

Statement of the Yearly Expence of Managing.

" To herd's wages, or pasture of 60 sheep,	-	-	-	L. 7	10	0
" To his own and dog's maintenance, 6l. 10s. and a plaid, 6s.	-	-	-	6	16	0
" To expence of smearing (140 of the stock),	-	-	-	2	6	0
" To gathering, clipping, and bringing to market,	-	-	-	2	7	0
" To interest of stock, valued at 376l.	-	-	-	18	16	0
" To rent,	-	-	-	52	10	0
				L. 90	5	0

"which must be the most general in the Highlands, I shall take my statement, as nearly as I can judge, from a stock as actually kept."

"To 690 milk ewes, at 14s. each, none to the	
"score, - - -	L. 483 0 0
"To 25 tups, at 14s. each, none to the score,	17 10 0
"To 85 gelt ewes, at 9s. 6d. each, one to the	
"score, - - -	38 9 1
"To 380 wedder hogs, at 9s. 6d. one to the	
"score, - - -	171 18 2
"To 340 dimmonds, at 12s. one to the score,	194 5 8
"To 320 three year-olds, at 14s. one to the	
"score, - - -	213 6 8
"To 160 ewe hogs, at 9s. 6d. one to the score,	72 8 1
2000	Value, L. 1190 17 8

Annual Sales.

"By 300 draft lambs, at 4l. 10s. per clad score, and	
"30 <i>fat</i> s, at 2l. 5s. per ditto, -	L. 67 10 0
"54 draft or <i>fack</i> ewes, at 6s. 6d. -	17 11 0
"10 <i>yield</i> ewes, at 11s., and six old tups, at 12s. -	9 2 0
"460 white fleeces, making 46 stones, at 7s. -	16 2 0
"140 fleeces laid, making 20 stones, at 5s. -	5 0 0
	L. 115 5 0
Expence as above,	90 5 0
Profit *, - - -	L. 25 0 0

"The profit arising from such a stock seems inadequate to the trouble and risk; but it is to be observed, that, in most sheep farms, there are some low and arable grass grounds, the produce of which, in estimating their value, is seldom taken into the account. Much depends upon the times, and much upon the management. In the event of a severe winter or spring, the number of lambs for sale falls often one third short of the foregoing statement." *Stat. Acc. XVII. p. 260.*

* In this is included risk and loss, as only 5 per cent. interest was allowed on the capital.

Annual Sales.

" To 315 three year-old wedders, at 14s. one			
" to the score, - - -	L. 210	0	0
" To 105 old ewes, at 6s. 6d. one to the score, 32	10	0	
" To 21 gelt ewes, at 9s. 6d. one to the score, 9	10	0	
" To 6 aged tups, at 10s. none to the score, 3	0	0	
" To 84 shot lambs, at 3s. one to the score, 12	0	0	
" To 84 ewe lambs, at 5s. one to the score, 20	0	0	
" To 1435 white fleeces, at 10d. each, - 59	15	10	
" To 565 laid or smeared ditto, at 10d. each. 23	10	10	
	L. 370	6	8

Charges and Expences.

" Interest of 1190l. at 10 per cent, -	L. 119	2	0
" To 189 wedder lambs, bought in, to keep up			
" the stock, at 5s. each, one to the score, 45	0	0	
" To 24 bolls meal, at 16s. per boll, for three			
shepherds and dogs, - - -	19	4	0
" To laying 736 hogs and tups, at 4d. each, 12	5	4	
" To gatherings, clippings, luck-pennies, &c. 15	0	0	
	L. 210	11	4
* From amount of sales, - - -	370	6	8
" Deduct charges and expences, - - -	210	11	4
Remains for rent, L. 159	15	4	

" By this state it appears that about 20d. per sheep is a fair
 " rent for such a stock *."

* In this county some sheep lands are lower, and some higher, than this rate. Of late years, the price of sheep has risen so high, that from 2s. to 2s. 6d. is given for the graze of a sheep in good lands. It seems to have risen with the price of wedders in proportion of one to eight; or, in other words, one-eighth of the price drawn for wedders, was the rent given for the graze of a sheep.

“ The prices in these statements are not made upon the sales of the year 1793 (when they were drawn up), but upon an average of six years preceding; the peculiar circumstances of that year making it proper to leave it out of the question.”

That our mountains are better adapted for sheep than for black cattle, cannot admit of a doubt. Under the sheep system, they make a much better return both to the farmer and to the landlord; and furnish, in the wool of the sheep, a large fund for manufacture and for commerce. But all these advantages are more than balanced by the effect which sheep have produced upon population. When one man occupies the space which would maintain 10 or 20 families, his private gain will by no means compensate for the public loss. To banish that hardy race by which its battles have been fought, and its fleets manned, must prove a great loss to the kingdom at large; it must also be a serious loss to the county to have its numbers greatly diminished; as it is certain the riches of any country must be in proportion to the number of its people, if their industry is properly directed, and their property protected by good laws and a stable government. The landlord may think that all this is nothing

But no general rule can be laid down, as so much depends on the nature of the pasture, its healthiness, ease of herding, natural divisions, convenience to market, and other circumstances. One possession may be cheaper than another though it pay a third more for the grazings of a sheep. In Lanark, the grazing of a sheep is said to be 2s. and thought too high. (*Stat. Acc.* IV. 508.). In the county of Roxburgh (*Rep.* p. 58.), an acre of the sheep lands will nearly maintain a sheep. In Stirlingshire (*Rep.* p. 49.), “ an acre and a half is required to make a wedder fat.” In the hilly grounds of Dumbartonshire (*Stat. Acc. of Lufs*), the same extent is necessary for the pasture of a sheep; and in the sheep lands in Tweeddale (*Report*), the allowance for the grazings of a sheep is generally two acres. In this county, where many of the mountains are both high and barren, it is thought that two acres may, in general, be too small an allowance. But the nature of our pasture is so various, that no general rule can be applied to it.

to him, if one man can give him a higher rent than 10 or 20. He makes no account, perhaps, of the pleasure of communicating the means of subsistence and happiness to a number of the industrious poor, who are his fellow creatures. He makes no account of the political consequences which he might derive from their numbers, in great and possible emergencies. He makes no account of the assistance which their forefathers gave to his, in obtaining and defending those possessions from which they are now expelled *. But he should make some account of the cultivation of his lands, to which this system, as now carried on, puts a total stand. Nay, worse than this, the ground rescued from the heath and wildness by the labour of ages, is in the way of becoming a heath and wilderness again. By means of sheep, rents may be raised more rapidly, but will not admit of much further progress. By means of cultivation, they are advanced more slowly; but by a gradual progress will soon arrive at a much greater height. Accordingly, it will be found that the Duke of Argyll, and others, who have encouraged population and small tenants, have not only their estates better cultivated, but their rents in the way of being much higher advanced, than those of lands under the other system.

Land owners may suppose, that as a shepherd and his dog can manage a whole farm under sheep, he can afford to pay more rent than half a dozen of tenants, who have as many families to support on the produce of the farm. But they should consider that the gentleman farmer works none, and lives at more expence than half a dozen, or twice as many poor families; and also that these families would bring their own frugal support out of those grounds which the other

* This just and noble sentiment was uttered by a Highland Chieftain, who was advised to remove his people, and put his lands under sheep: "Their forefathers got or secured the estate to mine, by their blood and their lives, and I think they have a natural claim to a share of it."

allows to lie waste, and also enlarge the food of animals with artificial supplies. They should likewise consider, that no country can become rich by following pasturage alone. Pasturage must be conjoined with agriculture, and both of them with manufacture and commerce, before any great degree of prosperity is to be attained. Land owners should therefore study to unite all these advantages in one system, by encouraging small tenants and population, so far as the nature of the lands will allow; by which their estates would be always improving, their rents progressively rising, and the country flourishing.

The following fact may serve to illustrate and corroborate what is here proposed. Some years ago, a large estate in this county was converted into sheep-walks, and let at an advanced rent to a few stobremasters. From 25 to 30 of the former tenants, who could not dispose of themselves otherwise, were allowed one large farm among them all, and the rent of it advanced in the same proportion with those around it. The arable part of the farm, with as much more of it as was capable of cultivation, was divided into as many shares as there were families, and each set down upon his own lot. Here they fell to work with plough, spade, and mattock; occasionally uniting their forces to what they could not singly perform. At the same time, they joined their little money and credit, to put a common flock of sheep on the mountain, and employed a common shepherd to take the charge of them. Their flock prospered, their fields produced abundantly, and they were yearly becoming larger, by adding to them a portion of what had formerly been waste. The men not only raised a sufficiency of food to serve their families, but some of them had also a surplus to spare; while the wives spun a considerable part of the wool, and sold the yarn at the market. In short, they so improved the ground and their own circumstances together, that it was thought they could do well

enough without the mountain; of which they were accordingly deprived, and their hopes of thriving vanished. The experiment, however, was fairly tried; and from 100 to 150 souls paid their rent, and derived their living from one farm, perhaps without any sensible diminution of the cattle which it was capable of maintaining, if no part of it had been tilled. Had the wisest politicians set themselves to contrive what plan would be most for the general interest of this county, perhaps they could not have devised a better than this, in which every part of the soil was applied to its proper use, and in which tillage, pasturage, manufacture, and commerce were all united, so as to give each other their mutual aid. By such management as this, the hills might be covered with sheep, the plains with corn, the lands improved, and the people numerous and happy. When the mountain of one farm is too small to give a sufficient range for a flock, those of two or three might be joined, and each have an interest in the flock, in proportion to its share of the bounds*.

It is to be regretted, that storemasters pay no attention to the cultivation of their arable grounds, which would be of great benefit to themselves; especially by furnishing green winter food, and of great benefit to the poor, by giving them employment. They might likewise give the female poor employment, in spinning the wool; by which means it could be more easily exported, and draw more money into the county, if it should not be made into cloth with ourselves. It is surely improvident to export our wool in its raw state, and bring part of it back again in cloth, at ten times more than

* In the upper parts of the county it is not uncommon to see several small tenants on the same farm, having their sheep-stock in common, and their arable fields in *run-rig*. It would be an improvement on this plan, to have the arable lands divided, as every man would then turn his own share to a better account; as has been found to be the case in Kintyre. See p. 73.

we received. Sheep would be of double the benefit to the county that they are at present, if we should learn to manufacture the wool at home; as we easily might, if population were encouraged, and the industry of the poor properly directed*.

Goats abounded in this county some time ago: but the attention paid first to woods, and then to sheep, have now almost banished them. On the continental part of the county, it is supposed there may be at present about 4500, and nearly one-third of these are in the parish of Kilmalit. The goat is an useful, though neglected animal, and so well adapted to our soil and climate, that it may yet be considered as a loss, if the species be allowed to perish. It is liable to no diseases; it finds its food where no other animal is able to travel; its milk, of which it gives a large quantity, is medicinal, and makes excellent cheese by itself, or mixed with the milk of cows. Its flesh, too, particularly the juice of it, is nourishing, and much recommended for many ailments. The tallow is considerable; and from 12 to 16lb. of it have sometimes been got from one goat. The skin of it too is valuable, and has lately sold in some places from 5s. to 7s. 6d. †, and in this county at 4s.

* Might not our storemasters breed some of their sons to the manufacturing business? Might they not employ all the female poor in their neighbourhood in spinning their wool? Might not a manufacturing village be also established in every parish under the sheep system; and, if necessary, some carding and spinning machines (driven by a horse or by water) be employed in each of them? The simplest and coarsest manufactures should be set on foot at first, such as the making of coarse stockings (of which every frame would work about 600 pairs in the year); coarse blankets; plaidings, which might be thickened and dyed for clothing to the army and other uses; carpets, and coarse sarges for carpet coverings, &c. The wool exported raw from the continent of Argyllshire, might, if thus manufactured, employ at least 2000 people, and add from 30 to 40,000 pounds to its revenue. Why should not a county attend to the loss of exporting its wool in its raw state, as well as the nation at large, which prohibits such exportation under the severest penalties?

† *Agric. Rep. of Anglesea.*

The goat, in some situations, and with proper attention, might perhaps prove a more profitable animal than the sheep. In good keeping, they have often two kids at a time, and may be brought to weigh, when fat, six stone of tron weight *. With us, some weigh from 16 to 18lb. the quarter. If none should be disposed to make the experiment of stocking a farm with goats, they might at least allow a few of them to pasture with their sheep, as they would find their food in precipices to which sheep could have no access. A few in the upper parts of this county do so, and find it an advantage. In Northumberland they have generally a few of them mixed with the sheep, for the health of the flock, as it is known they eat, with safety, plants which to other animals would be poison †.

If it shall ever be the good fortune of this animal to come into favour with us again, there is no doubt but other species of it might be introduced, and thrive; such as the Chamois goat, so valuable for its skin; and the Natolian goat, which has hair as fine as silk. We might also learn to manufacture the skins of our goats, if we had many of them, into Shamoy, Morocco, and Cordovan leather, and greatly increase our profit. No useful animal that we have should be lost; let us rather add to their number.

SECT. III.—*Horses.*

THE horses of this county are of different shapes and sizes, according to the degree of care bestowed on the breed, and rearing of them. The best of them are of as large a size as the soil will admit, and of a tolerably good shape. They are short, thick, and compact in the body; strong, hardy, sure-footed, easily fed, and patient of fatigue and labour; No

* *Agric. Rep. of Dumbarton.*

† *Agric. Rep. of Northumberland.*

breed can be better adapted to the country than the best of the native kind.

Since the introduction of sheep, the rearing of horses has been much neglected in the higher parts of the country; and in the lower parts, where the land is mostly occupied by small tenants, they can seldom be commended either for their size or their shape. In the district of Kintyre, they are not indeed in general wanting in size, but very much so in shape. They are long-bodied, long-legged, hard and high in the bone, and ill to support. Some of the farmers lately joined in buying one or two large stallions of the low country kind, but whether any great advantage will result from this cross is yet doubtful. The late Sir A. Campbell of Inverneill brought an Arabian horse to his estate, but the cross was considered as rather delicate for the soil and climate.

The best way to improve the breed, would certainly be, to select the best sires and dams of the native kind. It is generally thought that the best of the native breed of this country are to be found in the Island of Mull, probably owing to their being less contaminated with any other breed than those on the continent; though the tradition of the country ascribes the superiority to some horses having got ashore from a ship of the Spanish Armada that was wrecked or sunk on the coast of that island. It is remarkable, that a like tradition prevails in Galloway, and is assigned as a reason for the excellence of the Galloway ponies. Could these traditions be depended upon, they would seem to promise much improvement from crossing the ancient breed of the country with horses imported from such parts of Spain as come nearest to the soil and climate of this country. The tradition, vague as it is, certainly merits so much attention as should induce some patriotic gentlemen to make the trial. In the mean time, if it shall be thought advisable to cross any other breed in Scotland with the best of our own, which may admit of great doubt, it

should seem to be the best of the native Galloway breed *. Both were originally of the same old British breed, and both still retain much of their original excellence and distinguishing characteristics. Some of the same breed exist also in the mountains of Wales, and it would no doubt answer to cross it with that of the Highlands. If, in the improvement of our breed, we look at all beyond our own, it ought to be by crossing it with one or other of the kinds mentioned, as no other that is heavier and less hardy would suit the country.

' The neglect of the native breed of horses, and the danger of their being nearly banished, like black cattle, by the introduction of sheep, and the risk, or almost certainty of getting no breed afterwards in their place that will suit the country so well, are matters that deserve the serious attention of landlords. An evil may be easily prevented, which it may not afterwards be possible to repair. Horses, where they give so little trouble, as with us, are a profitable stock; and even in that view, the breed of them deserves to be more attended to than it is.

SECT. IV.—*Hogs.*

HIGHLANDERS, till very lately, had a foolish prejudice against pork; though it appears, from Adomnan, that in the sixth century it made a considerable part of the food of their forefathers. Swine, however, are getting into more repute,

* This breed is reduced now to a small number in Galloway. But the few which remain of it, "though small, are remarkable for figure, spirit, and durability." *Stat. Acc.* VII. 56.

It is remarkable, that in the *Norwegian Account of Haco's Expedition* (published by Johnston), it is said, that in the battle of the Largs, in 1263, the Scots had Spanish steeds completely armed. "*Sponsk eis oll fordykt.*" So that the excellence of the Galloway breed may be owing to its having been more than once mended by that of Spain.

and a few of them are bred in most parts of the county. They abound most in the district of Kintyre ; but even there not above 400 of them are reared annually. They are of different kinds, but mostly of the small dunnish white breed, with erect ears. In other parts of the county some gentlemen have got a few of the small black Chinese breed, which are easier fattened, and less mischievous. These are also the best breed for a poor man, and ought to be more propagated.

As no animal yields more profit, or a quicker return than a sow, no gentleman, no farmer, nor even cottager should want a breeding sow. The poorest family could easily feed one with the offals of potatoes. Near the shore they could find much of their food in the ebb. They could easily be prevented from digging or abusing the ground, by cutting off the gristly or horny part of the snout, through which the ring is usually put ; which may be done without the least injury to the animal, when young. Wherever there is a dairy, they fatten well, and in a short time, upon whey and butter-milk. In many parts of England the profits arising from this circumstance are estimated at 20s. to every cow. Distillers would also find their profit in having plenty of swine. In England, where this business is much followed, the profit between buying lean, and selling fat, after keeping them 18 or 20 weeks upon the refuse of the still, is from 2l. to 3l. according to the size. But with those who have not abundance of food, the smaller the kind, so much the better, as they not only fatten with less and worse food, but in a shorter time. The Chinese, or a cross between them and a small white kind, will answer well. But let the breed be what it may, a well proportioned stock to every farm or family, will most abundantly requite the care, and repay the expence of any trouble or food required for them. A patch of clover might be well applied for their use in summer, by those who have not milk or whey, till the season of potatoes arrives. When kept in a sty, it is

of much consequence to keep them clean and dry, and not to allow them too much water. Cleanliness is necessary to their health and preservation, and a dry comfortable bed will help them much to fatten *.

SECT. V.—*Rabbits.*

THE only rabbits on the continent of Argyllshire are in a small island in Lochow, used as a warren by the Duke of Argyll. As they are very prolific, and their skin valuable, they would prove a profitable stock in suitable soil, and near a market. A tract of hilly sandy soil at Machirhanish Bay, near Campbelton, might be profitably occupied as a warren. A ready market could always be found for them in Campbelton or Greenock. Where this species of stock is reared, the carcase usually sells for 4d. and the skins, which are of more value than the carcase, from 5s. to 10s. per dozen. A rabbit warren in the parish of Old Luce (county of Wigton) is rented at 100l. a-year.†. Where rabbits are kept, the famous breed of Lincolnshire ought to be procured, which, from the superior beauty of their skins, are peculiarly profitable.

* To what extent and advantage the rearing of swine may be carried on, will appear from the following extract from the Statistical Account of the Parish of Lochmaben: "Every body, even the cottars, feed swine; many of the farmers five or six, or more, in the year. When fat, they are sold at between 3l. 10s. and 4l. per head; or threepence farthing per pound, as uncured pork; when salted and dried, they sell at sixpence per pound. There are people who make a trade of salting and curing them. There may be 1000l. worth sold in this parish annually, besides what is consumed by the inhabitants. It is affirmed by some who are conversant in that business, that from Nith to Sark and Elkfoot, an extent of country of about 30 miles the longest way, and about 16 the shortest, there is above 20,000l. brought in annually for swine." *Stat. Acc.* VII. 243.

† *Stat. Acc.* XIV. 494.

SECT. VI.—*Poultry.*

As this county does not abound in corn, neither does it in poultry. Every family, however, has a few; the tenants of almost all the smaller proprietors are liable to the payment of so many hens and eggs. But then, if they have the tale, no more is to be said. Under these circumstances it cannot be expected that any pains will be taken to improve the breed.

Many of the gentlemen, and a few of the farmers, rear some geese and turkeys. There are some instances of domesticated geese, near the sea, associating with wild ones in summer and harvest, and bringing some of these strangers home along with the flock at the approach of winter.

SECT. VII.—*Pigeons*

A FEW gentlemen (under a dozen) have pigeon houses. But the stock is generally small, and their tenants do not regret it.

SECT. VIII.—*Bees.*

IN a county in which there is such a vast quantity of heath and flowering herbs, it is surprising there are but few bees. They are a profitable stock, but they require attention; and they well deserve it. And now there is the greater reason to attend to them, when sugar is come to such a high price; as honey might serve many of the purposes for which sugar is used in families*. The wax too is of great value. For a

* The dearth of sugar has induced some chemists to convert honey into a sweetener for common use; which may be done by the following process: Take three parts of honey (by weight), add eight of water, and one of chas-

few years past, the seasons have proved very unfavourable to them in this country. But it is hoped that this may not be long the case, and that a regard to bees will become more general. That kind of stock which doubles or trebles itself in a year is surely worth the having.

Such as wish to study the management of bees may consult Mr. BONNER's Treatise upon this subject, lately published. This man has himself no less than 80 hives, and says he has by this business supported a wife and 10 children. If, as he proposes, there should be 300 hives in a parish (and our extensive parishes might have more), and the profits of each estimated only at 20s. a-year, this, on the continent of Argyll, would be 7500l. a-year. This is surely deserving of attention, though far short of the calculation of Mr. WILDMAN*.

coal, broken into small pieces, but not into powder. Boil this mixture for an hour; after which filter it, so as to separate the charcoal, and then let it evaporate over a slow fire, to the consistence of a thick syrup; which will be as agreeable to the taste as sugar.

* See *Agricultural Report of Bedfordshire*.

CHAPTER XIV.

RURAL ECONOMY.

SECT. I.—*Labour.*

WITHIN these 30 years the price of labour in this county is somewhat more than doubled. It still varies in different parts of the county, but may be estimated in general at the following rates* :

Man servant's wages per ann. with victuals,	from 6l. to 8l.
Maid servant,	from 5os. to 4l.
Masons and carpenters, with victuals, per day,	from 1s. 6d. to 2s.
Labourer's wages, ditto, ditto,	from 8d. to 10d.
Tailors and shoemakers, ditto, ditto,	from 8d. to 10d.
A plough or cart horse,	from 10l. to 18l.
A pair of cart-wheels,	from 5os. to 3l. shod.
A wheel-barrow,	10s. or 12s.

A plough from 5s. to 10s. according to the plenty or scarcity of timber; most make their own. Smiths are generally paid so much a-year. In some places they have, besides, certain perquisites, such as the head of the mart, a cheese, and some corn; which, like all other servitudes, ought to be abolished.

* These were the rates in 1795, or two years ago. Since that time wages and the price of labour have been advanced more than one fourth, or from 25 to 30 per cent. and are still rising.

Formerly a peck of meal (Dutch weight) was reckoned equal wages for a labourer in the day without victuals; and half as much to a woman. Out-servants get two pecks of meal a-week, or six 1-half bolls a-year, and sometimes grafs for a cow, with such wages as may be agreed on. But few out-servants (except shepherds) are employed.

Servants have no stated hours for working; but day-labourers work only from fix to fix, where they are much employed, in summer, and till night in winter.

Piece-Work.

There is little done by the piece except ditching, and building stone dikes; the first (of which a man will commonly make one 1-fourth fall in a day), from 1s. to 1s. 2d. the fall, of six ells; and the other from 4s. to 6s. according to the convenience of stones; and from four to five feet high. A fall (or six ells) of four 1-half feet dike will take about 15 carts of stone; a good hand, with good stones, will build two 1-half falls of it in a day; and a cart, travelling only at the rate of 16 miles a-day, will bring 32 loads, or more than will build two falls, from a distance of 1-fourth mile.

SECT. II.—*Provisions.*

Cows and sheep have nearly quadrupled their price within these 40 years. Butcher-meat, where it is sold by the pound, sells commonly at 4d. the English lb. The price of butter and cheese, in the above period, is more than doubled. At present butter sells from 10s. to 12s. the stone (24 lb.), and cheese from 4s. 6d. to 6s*. Oatmeal for some years past has been generally about three halfpence per lb., at present it is 2d. Bear 25s. per quarter; potatoes 10s. per boll, making five barrels unheaped, and weighing about 800 lb.

Whence the Markets are supplied.

Meal is the only necessary article of food that is imported

* Since writing the above, in 1795, the price of butcher-meat, and of butter and cheese, is greatly advanced in consequence of the rise in the price of cattle.

to this county. It is generally brought from Ireland, but sometimes from the north or south of Scotland. The quantity imported yearly to the continent of Argyll is about 20,000 bolls. There are, besides, about 3000l. worth of flour yearly imported from Clyde. It is to be hoped that, in a short time, we shall raise enough of both to serve ourselves.

SECT. III.—*Fuel.*

In Campbelton and Inveraray the fuel mostly used is coal. Coals are also used in part by many gentlemen along the sea-coast. But the general fuel of the county is peat. In many parts of the county this fuel is nearly run out by bad management; and the want of it must soon be severely felt, if measures are not taken to supply it with wood, which must probably be the ultimate resource.

The injudicious and irregular mode of cutting peats which almost universally prevails, is, in many respects, a very serious evil. The moss, by cutting it in pits and holes, is soon rendered a perfect bog or quagmire, unfit for giving any supply of fuel; it is made dangerous, and often fatal to cattle; and almost incapable of being brought, if wished for, into a state of cultivation.

Land-owners have been too long inattentive to a matter of so much moment. All tenants should be bound to cut their mosses regularly, and all of the same depth, so as that the water may in no place be allowed to stagnate. They should be made to level the bottom of every piece as soon as cut, and to cover it regularly with the pairings taken off the surface. They should begin at the bottom, and proceed upwards, and open a drain, if necessary, to carry off superfluous water. If the ground, after being cut, is intended for pasture or cultivation, the peat may be cut to the clay, if the fall of the ground will admit of it. But when moss is scarce, it

will be proper to leave a foot, or more of it, so as that it may grow again. Moss, being a vegetable substance, thrives best, like most other vegetables, in a moderate degree of moisture. There is generally more danger of its having too much than too little. When it appears to need more moisture than it has, the outlet from it may be occasionally stopped; or it may be flooded, at due intervals, in the same way as watered meadows.

In the Islands of Lismore and Gigha, where the moss is so much exhausted that it cannot be cut with spades, they work the moss with their feet, and bake and shape it into peats with their hands. This operation makes the peats dear, but they are very lasting.

CHAPTER XV.

POLITICAL ECONOMY.

SECT. I.—*Roads.*

THE military roads which were made through the upper parts of this county between 40 and 50 years ago, soon made every person sensible of the advantages of having good roads and bridges. The heritors, with much public spirit, obtained an act of parliament, affessing the lands with 1s. in the pound of valued rent * ; borrowed or advanced money upon this fund ; commuted the statute labour ; and often contributed by voluntary subscriptions, till, by every exertion, the most public and necessary roads were executed. From their spirited exertions in this business much praise is due to them. Some of their undertakings were truly arduous. A mountain which separated Kintyre from the rest of the county, and which used to be climbed over to the height of about 1500 feet, was long considered as an unfurmountable obstacle. Of several estimates got of the expence of cutting a road for four or five miles along the base of the mountain, which is remarkably steep and rocky, the lowest was 3000l. The late Captain Atchibald Campbell of Glenlyon was the first who, after minutely examining it, affirmed it could be done for 1500l. This sum was immediately subscribed, and the road actually executed for 1440l. ; though in some places it passes through large rocks, which could be broke only by the force of powder. The same public spirited gentleman was the mean of throwing bridges over the two largest rivers in the

* Which makes the affessment on the whole county 623l. 6s. 3d. halfpenny per annum.

county, Aw and Urchay, by obtaining liberal subscriptions from the Duke of Argyll, Lord Breadalbine, and other heritors. Both, under his management, were executed for 1000*l.* a sum which was long thought to be much less than was requisite for the first of them; which shows that public money is capable of doing much more than is generally done with it. Indeed, these works would have been executed for still less money, if an unfortunate accident had not given the contractor a just claim for more than the sum agreed upon. The water of Aw, which discharges at one outlet all the collected streams of an extent of country near 50 miles in length, and from 6 to 10 in breadth, is remarkably large and rapid, and subject to sudden rises. After the work was begun in a very dry season, it was carried on with all possible expedition, but just as the arches were locked, and before there was time for removing the timbers, a sudden flood swept timber and stone before it, and obliged the undertaker to recommence his labours. The second attempt succeeded; and this useful bridge has since withstood every trial.

The most public lines of road in this county are now finished, but many bye-roads still remain to be done. A renewal of the act of parliament is now applied for; and there is reason to hope they will be carried on with the usual spirit. The county is divided into districts, and commissioners for each district meet twice a-year to conduct the business. The roads in this county being generally made of good stuff, and not much frequented by heavy carriages, are easily kept in repair. In some parts the farmer, at such a rate as may be agreed upon, takes the charge of keeping the road on his farm in repair. If this were an universal practice, it would be much for the interest of all concerned; as the person who is at hand can sooner see, and more easily repair a flaw, than any other. The expence of keeping a road in repair is

trifling, when it is taken in time, compared with mending it, after being long neglected.

As wheel-carriages were not much known in this county when the roads began to be made, too little attention was paid to the directing of them in those lines that were most level. Instead of going round the foot of a hill, they often go over it, in a line that is no shorter; and instead of seeking the level round a hollow, they climb the one side and descend the other, by which they spoil the road, without lessening the distance. As many of these errors have already been rectified at a great expence, and more must be so still, it is to be hoped that the wisdom which is thus dear bought will lead all conductors of new roads to pay more regard to level lines.

In making or mending roads care should be taken to use only good stuff. When earth or clay is used instead of gravel, the traveller must walk through mire. Roads should also be raised no higher in the middle than is necessary to make the water run off to the sides. When too high in the middle, carriages, by keeping the same track, cut it up in a very short time. Care, however, must be taken that the water run easily off into the ditches on the sides of the road, that it may not be forced to run along it. Ditches and drains should be cleaned and kept open, and the foundation of bridges, which are apt to be undermined, should be often inspected.

SECT. II.—*Canals.*

CANALS, like good roads, serve to lessen the expence of carriage, and to open the communication between one part of a country and the other, so as to enable the remoter parts to share in the advantages of those which are near the centre. Such works must therefore prove of great utility to a country. It is fortunate when they also yield a sufficient

profit to those who are so public-spirited as to undertake them. This has been the case with a small canal made a few years ago by the lessee of the coal-works near Campbelton, who made a canal of three miles on a level, to carry them to the town. A canal across the isthmus of Crinan is just now carrying on with great spirit. The length, from the point of Ardrifaig in Loch Gilp to the little Bay of Portree, where it terminates in Loch Crinan, is about eight miles. The breadth at the water's surface is 66 feet, and 30 at bottom; but the nature of the ground in some places occasions a variation in the breadth. The depth is a little more than 12 feet, to allow vessels drawing 12 feet of water to pass. The sea-lock at Portree admits vessels drawing 16 feet of water, because it is intended to make a dock there. There are eight locks on the S. E. and seven on the N. W. of the summit level, including the two sea-locks. The expence, it is supposed, will be about 80,000*l*.

It is in contemplation to carry another small canal from this one to communicate with Lochow, which is five miles from it. This would be of great advantage to all the lands bordering on that extensive lake, which is 24 miles in length; and would contribute much to the public and private advantages expected from the canal of Crinan.

The improvement of this county, and indeed of the whole kingdom, would be greatly promoted by another canal between Fort-William and Inverness, passing through the lakes of Lochy, Oich, and Ness. This would facilitate the navigation from Ireland and the West of Scotland, to Germany, Norway, and the Baltic; and it is hoped that so great a national advantage will not be long neglected, especially as nature has done so much, that little remains to be done by the hands of men.

The whole length of the line is thus stated by Mr. Knox.

	<i>Miles.</i>		<i>Miles.</i>
Loch Lochy,	10	River Lochy,	7
— Oich,	4	— Oich,	5
— Nefs,	22	— Nefs,	8
		Land,	2
	36		
			22

The expence of a canal in these 22 miles, to be 70 feet wide and ten deep, he estimates at 164,000*l*. The expence of a few days of war would do all this; and the internal improvement of the country would produce better, and more permanent fruits than foreign conquests.

SECT. III.—*Fairs.*

In different parts of the continent of Argyllshire, and at different seasons, there are 18 fairs held annually, for the sale of horses, cows, coarse cloths, yarn, and other articles. This number is thought to be sufficient for the country in its present state *. The sheep are generally bought on the farms by Yorkshire graziers, or by butchers from the low country.

* On these occasions, the people are generally peaceable and orderly, having mended much since the following description of one of our fairs was written in the year 1745. It is extracted from a MS. poem, by J. Campbell then schoolmaster in Appin.

“ Some stroll about among the crowd,
 “ Craving arrears and speaking loud.
 “ Some have no bus’ness, but they go
 “ In quest of bus’ness to and fro’.
 “ Some feast in tents on boil’d and roast,
 “ Some have their brogues, or bonnets lost :

SECT. IV.—*Weekly Markets.*

There are no weekly markets held in the county, as there is no place in it so populous as to require them. The borough of Campbelton is allowed by its charter to hold a weekly

" And many never sleep a wink,
 " But sit on earthy seats and drink
 " Strong muddy ale and whisky clear,
 " All night, with noise, that none can hear,
 " Upon the whole, what's fung or said,
 " By man or wife, or boy or maid.
 " Some strut about with hue and cry,
 " *Lamb t aib'r 's do jbeanar* *, you or I;
 " And roar out words I will not name,
 " Left pious readers should me blame.
 " Some pick a quarrel, some a purse;
 " But apprehended, swear and curse,
 " And urge their innocence on oath,
 " Though some are hurt and robbed both.
 " Here frugal widows, maids, and wives,
 " Buy madder, indigo, and knives,
 " Starch, coch'neal, spoons, beads and rings,
 " Cambrics, and forty other things:
 " For, far and wide, they all come here
 " To buy the necessaries of the year.
 " And, as at twenty other fairs,
 " The bouncing girls run through in pairs,
 " Each asking of the man she loves
 " A ribbon, handkerchief or gloves;
 " Till, horses sold, and all in trim,
 " He after her, she after him,
 " In hurry durry to the skore;
 " Some haul the boat, some cry—No more—
 " Some of the club, who stay behind,
 " That boat and crew are gone ne'er mind;
 " But stroll about, in their own way,
 " Till boat arrive some other day."

* *An expression of defiance.*

market; which it will probably do when its numbers are somewhat more increased.

SECT. V.—*Commerce.*

OF the little commerce of this county, it is difficult to give any precise idea. The following statement respecting the continent of Argyllshire is offered merely as a conjecture, formed upon the best information which could be obtained upon the subject.

Exports.

5500 Black cattle,	-	-	-	L. 26000	0	0
52000 Sheep,	-	-	-	40000	0	0
300 Horses,	-	-	-	2400	0	0
Wool,	-	-	-	7500	0	0
Fishings (including bounty and debenture),				30000	0	0
Kelp,	-	-	-	3500	0	0
Linen yarn, carpeting, and coarse cloths,				5000	0	0
Woods and bark (the woods mostly made into charcoal),	-	-	-	4500	0	0
Slates and mines,	-	-	-	8500	0	0
Freight of vessels,	-	-	-	8000	0	0
Potatoes (from Kintyre),	-	-	-	500	0	0
Butter and cheese (from Kintyre),	-	-	-	300	0	0
Salmon (from Bunaw),	-	-	-	100	0	0
				L. 136300	0	0

Imports.

Meal 20000 bolls,	L. 15000	0	0
Tea 10000 lb.	-	7500	0
Sugar,	-	10000	0
Tobacco,	-	6000	0
Tar and butter (for smearing),	-	2500	0
Carried over	L. 41000	0	0

Brought over	L. 41000	o	o
Staves for barrels, -	2000	o	o
Sail cloth and cordage,	5000	o	o
Sundry merchant goods,	70000	o	o
Iron, - -	3000	o	o
Timber (from Norway,			
Wales, and Clyde),	3500	o	o
Leather and raw hides,	2500	o	o
Salt and soap, -	5500	o	o
Flax seed (besides the Trustees'),	250	o	o
Wines and foreign spirits,	3500	o	o
		L. 136250	o o

By this statement, or rather conjecture, the country could scarcely save its credit; but a great deal of public money, drawn by those in the army and navy, and in public offices, and from adventurers to foreign countries, is constantly coming to our aid*; and if landlords would spend more of their rents at home, improving their estates, and encouraging agriculture, trade and manufacture, we should soon do very well, and see fewer estates going to the market, to make up for the balance of trade which has been for some time against us.

SECT. VI.—*Manufactures.*

MANUFACTURES have made little progress in this county. What we spare of our flax is indeed sold in yarn, but our wool is mostly exported in its raw state. About 20 years ago, the Duke of Argyll, with that patriotism and public spirit for which he is distinguished, set on foot a woollen manufactory near Inveraray. All the buildings and necessary utensils were furnished by his Grace *gratis*, and the farm on which they

* There are also about 50 or 60 of our weavers at present employed by the cotton manufacturers of Glasgow, which brings about 3000*l.* a year.

were erected, was given along with them at a very low rent. Many gentlemen of the county also favoured the undertaking, by advancing money to the manufacturer, at two 1-half *per cent.* *. All this uncommon encouragement ought, in a country abounding with wool, to ensure success to the undertaking; and yet it has not hitherto done so well as might reasonably be expected. Sometimes the want of conduct, and sometimes the want of capital, attention, or exertion, in successive managers or undertakers, have frustrated the just expectations of the noble patron, and of the public. It is impossible, however, but a scheme so well adapted to the country, and so much encouraged, must in time do well. At present about 600 stones of wool a-year are wrought here, chiefly into carpets.

The principal hinderance complained of by the present occupier, is, that he cannot get a sufficiency of wool spun to answer all the occasion he has for it. This might be easily remedied, if storemasters would give out their wool to be spun by the poor about them, where they have not totally banished the poor from their neighbourhood. It would be a pleasure to every humane person to give them employment, and the yarn could be more easily brought to market than the wool. The Lorn Furnace Company, with the laudable view of furnishing employment to the wives and daughters of their workmen, and to the industrious poor around them, were for many years in the use of buying wool, and giving the one half of it for spinning the other into coarse yarn, which they sent to England. How easily might storemasters, by the same plan, furnish employment to the poor, encourage manufactures, and benefit the country? Were this plan generally followed, and our wool made into cloth by ourselves, every stone of it, instead of 6s. or 7s. might bring into the county six or seven

* See *Stat. Acc. (of Inveraray)*, V. 297.

times that sum, and procure to thousands the means of comfort and independence. It would also contribute to improve lands, and raise their value, by that increase of riches and population which are the natural consequences of manufactures. Wool is our staple commodity, and it is of the utmost importance to us that we should manufacture it ourselves. This could easily be done, if land-owners encouraged the poor, instead of banishing them, as many do, from their estates. To such it is idle to talk of humanity and charity; but it might be expected that they would at least attend to self-interest, and observe that the value of estates must always rise in proportion to the numbers of the people, and increase of manufactures and of commerce. The progressive improvement of the Duke of Argyll's lands, and some others, under tenants of moderate possessions, contrasted with the stationary or retrograde state of those lands which are parcelled out in immense tracts to storemasters, will show this clearly to any eye that will look at both.

In some parts of the county the poor have of late begun to buy parcels of wool, which they spin, and sell in yarn to dealers, or at the country fairs. This species of industry ought to be greatly encouraged. It is the first step towards a general introduction of the woollen manufactures. It is hoped that more factories than that at Inveraray will soon be amply supplied in this manner. Where the hands are few, carding and spinning machines might be introduced *. Every thing should be done to prevent the exportation of our wool in its raw state.

* The manufactory at Inveraray employs one carding, and two spinning machines. A subscription was set on foot a few years ago for erecting a carding machine (to be drawn by a horse), and some spinning jennies, at Oban; but the war, and other circumstances, have hitherto prevented the scheme from taking place. A great number of weavers in Campbelton and its neighbourhood have been employed for some time in working cottons from Glasgow, which may lead to the introduction of this manufacture into the county.

While this is done, we can, comparatively speaking, derive but little advantage from our sheep and mountains.

The advantages that might be derived from raising a manufacturing of flax and hemp, have already been considered. A bleachfield lately set up in Kintyre, by aid and encouragement of the Duke of Argyll, will greatly facilitate such manufactures in that part of the county. Tanneries have for some time been established in Campbelton and Oban; which save to the county a great deal of money that used to be sent away for well-dressed leather. Many other cheap manufactories might be established, such as the making of bricks, tiles, pottery ware, &c. especially in Kintyre, where they abound in coals. A salt-work in that part of the county is not only much wanted, but indispensably necessary to the prosperity of the county. But this can never take place while the importation of rock salt is prohibited. Our fisheries can never thrive till the salt laws are altered. As they stand at present, they are oppressive to the subject, and unproductive to the government. A revision of these laws is loudly called for, and anxiously expected. "What is necessary for nature (says Montefquien), ought not to be taxed at all; what is useful, "to be taxed a little; what is superfluous, most." Salt, in a country which depends so much upon fishing as this does, falls under the first description, and ought to be free from every restraint. Might we not at least be allowed, as in Ireland, the liberty of importing rock-salt? Fishing is the occupation of a great number of the people of this county *. On their own shores, and elsewhere, they catch in some years from 40 to 50,000*l.* worth of fish. Thus they add to the national riches, and merit national encouragement, by removing every obstacle in the way of their industry. As a seminary

* In Loch Fine alone there are sometimes 600 fishing boats: in all the county there may be 1500.

for seamen, this business deserves still more to be cherished by the public. If it were, the number of seamen, and the quantity of fish caught on this coast, and along all the coast of the Highlands and isles, would probably be double to what it is at present.

The richer inhabitants, who can fit out large vessels, and comply with all the customhouse regulations, may be able to follow the fishing business, under the present system of laws; but the poor, who make the far greater part of the inhabitants, are effectually excluded from any share in those advantages which their situation, and the bounty of Providence, place within their reach*. The route of the herring is uncertain, and if the poor man had the ability, it would be imprudent to take the trouble and expence of getting entered salt, until he sees whether he may have any use for it. When the herrings start upon the coast, or in any loch that is near him, while he is thus unprovided, it is idle to think of catching more than he can eat of them. The customhouse may be 50 miles from him, his open boat may be unfit for the voyage, or, should he attempt it, cross winds and accidents may prevent his returning before the herrings have departed, or his

* By act 26. Geo. III. a bounty of 1s. a barrel (afterwards raised to 2s.) was allowed for every barrel caught by *boats*. But the poor, who fish in boats, owing to the want of salt, are seldom or never able to avail themselves of this bounty, of which many of them are totally ignorant. By the same act, a bounty of 20s. a ton was allowed to the *busses* or larger vessels, besides 4s. a barrel, provided the number did not exceed two and a half for each ton; as also a bounty of 2s. 8d. on every barrel exported; which, as it was commonly sent to Ireland, where it paid a duty of 1s. 1d. was thereby reduced to 1s. 7d. This act gave the rich a decided advantage over the poor, but more active and laborious race of fishers, whose herrings, to add to their hardships, the owners of busses were not allowed to buy: A regulation extremely hurtful to both parties. The fishing, with all the aid it gets, is not thriving. The owners of busses are often ignorant of the business in which they embark, and must trust it to others; while the actual fishers, whose labours enrich the state, and whose strength defends it, are excluded from the advantages which ought to fall to their share.

salt may be damaged or embezzled, and all the penalties of the law incurred innocently. At any rate, he must go back to the customhouse with his little fish or little salt, though perhaps not altogether worth half the expence and time and trouble which the two voyages must cost him. In short, it is almost impossible for human ingenuity to devise any law more oppressive to the industrious poor of these parts, than that by which the salt for curing fish is at present regulated; and it is impossible to think that a wise and kind government, such as we are under, will continue to shackle the hands of the industrious poor in these iron fetters*.

Salt, like meal, a necessary of life, and almost the only luxury of the poor, should be free of duty. Until it is, the poor must continue to groan, and the fishings in the Highlands to languish. All the benevolent schemes of building fishing villages, and other plans for improving these coasts, must for ever be defeated, while the present salt laws are in force. Let government abolish these, and landlords give moderate encouragement, and towns and villages, in proper situations, will rise almost of themselves. Riches will be got from the

* The multiplicity of oaths required by the customhouse regulations respecting salt, &c. must be considered as highly injurious to the morals of a people. Oaths should be administered as seldom as possible, and then with all possible solemnity. When they are administered too frequently, and on frivolous occasions, instead of being considered with awe, they are lightly thought of, and the consequence is dangerous to society. The same observation is applicable to those *baron-bailie* courts which used to be held, and are not yet entirely given up. To these a whole parish or district was frequently called, and, contrary to law, and to the natural right which every man has not to condemn himself, every man was required to swear whether he killed any black fish, or felled any timber. As the punishment was arbitrary, and frequently no less than being seized as a recruit, the temptation to perjury was strong. How came you to swear that you cut no timber (said a man, on one of these occasions, to his neighbour), when I myself saw you cut a beam for your plough? God help me! (answered the poor man), I did so; but I thought it better to put myself in the mercy of God, than in the mercy of — —.

deep, lands will be improved, population increase, and emigration cease. The trifling loss to government will be more than made up by the consequent increase of taxes upon other articles of consumpt. The British government has not in all its dominions a more loyal set of people than the Highlanders, ever ready to conquer or perish in its cause; and had they as much attention paid to them as some of its distant colonies, they would have proved of more value to the empire than perhaps any one of them; and the more so, as they are nearer home.

SECT. VII.—*Poor.*

IN this county, as in most parts of Scotland, the poor are supported partly by what they get by begging, and partly by the weekly collections of the church. The number supported in either way is, in general, very inconsiderable; as they have a modesty and spirit that makes them endure almost absolute want, before they can bring themselves to the mortification of receiving any public aid. This innate disposition keeps them from being almost any where a burden. What they get by begging, cannot be computed with precision; but all that is bestowed on them otherwise, amounts to very little; as will appear by viewing the Statistical Table.

No fund can be more faithfully and economically managed than that under the care of the kirk-sessions; but, in most parishes, it affords but a very inadequate relief to the exigencies of the poor. Charity and justice both require that something should be done to make their situation more comfortable; as is now done in many other parts of the kingdom. Voluntary assessments would tend to equalize the burden, and could not be grievous, while laid on by those who are themselves to pay them. It will perhaps be said, that the poor, by this means, will become a greater burden than they are at present. So they ought, at least to some, by whom at present they are

greatly neglected. When the poor have a legal title to more aid, why should they not have it? The small pittance that would then fall to their share, would make them happy, and be little missed by those who would fall to give it; nor can it ever enrich those who unjustly withhold it. Instead of this, it must, like a canker-worm, eat up their inheritance. It is the glory of our constitution, that it makes a legal provision for the poor, the infirm, and the helpless. Let this be given, and the poor, as well as the rich, will feel their interest in supporting the constitution. Policy, as well as justice and charity, point out the necessity of this measure. No subject more loudly calls for the attention of the rich, the just, the humane, and the wise, than the state of the poor does at present. When the Sundays collections are sufficient, nothing can be added to the care, frugality, and disinterestedness of the managers, but a little more attention and encouragement than is usual on the part of the heritors. Where they are not sufficient, the little additional aid which is necessary, and justly due, ought to be cheerfully and immediately bestowed*.

The establishment of friendly societies is not yet much known in this county. The sailors of Campbelton formed one many years ago, to which every man contributed 2d. per month of his wages; which, for the more effectual payment, was retained and paid by the master or owner of the vessel. But owing to some inattention to the management, the fund has not answered the end which it was certainly well calculated to serve. Such societies ought to be formed and encouraged among the labouring poor and servants in every parish. This would strengthen their habits of industry and frugality, cheer the prospect of old age, and help to relieve the parish of their burden, when sickness or infirmity would seize them. A trifle which they could easily spare out of their wages when

* See Chap. IV. Sect. 4.

young, would help to make their old age somewhat comfortable, and contribute to serenity of mind and cheerfulness of spirit. A dignity of mind, and a regard to character, would also be inspired by independence.

An act of parliament passed in July 1793, and extending to Scotland, puts all the charitable societies who choose to accept of it under legal protection, and gives them particular privileges, which is a great encouragement to such as may be wise enough to form them*.

SECT. VIII.—*Population.*

THE state of population in this county, as it stood in 1755, and as it stands at present, may be seen in the Statistical Table in the following chapter. Although many parishes have greatly decreased in their number of inhabitants, owing to the prevalence of the sheep system, yet, upon the whole, the number is greater now than it was 40 years ago. This is owing to the greater population of the town of Campbelton, and village of Oban, which have more than doubled their joint numbers in that period; so that, if these are left out of the reckoning, the population in the county will be found to have decreased considerably.

If landlords would encourage population, by giving moderate possessions, by cherishing cottagers, and adopting such plans as would tend to the cultivation of the ground, there is no doubt that the county could easily maintain double its present numbers. There is every reason to believe, that in very remote times it maintained more. Of this the whole face of the country seems to give sufficient indication. Fields, now covered with heath, and at a great height in the mountains,

* See *Observations on the Act for the Relief and Encouragement of Friendly Societies*, by the Gentlemen who framed the Act.

retain still the traces of ancient cultivation. The remains of castles and forts, mouldered into dust, and at short distances from each other, are undoubted proofs both of opulence and numbers. The unaccountable mode of vitrifying the walls of some of these buildings, before lime was used as a cement, is a further proof not only of the opulence and numbers of the inhabitants, but also of their civilization, and knowledge of some of the arts and sciences.

The vast number of churches, of which the names or vestiges still remain, and their vicinity to each other, is a further proof of more than modern population. The very monuments of the dead, whose ashes are found under such vast heaps of stones, in many parts of the county, as would require many thousands to collect, and to carry to the distance at which they must have been brought, are another proof of the power and population of this county in ancient times.

The superior population of this county, in ancient times, might be further illustrated by a detail of historical facts, if this were a proper place to enter on such a disquisition. The accounts transmitted to us of the armies, navies, and conquests of some of the Scottish kings, whose territories hardly extended beyond the limits of this county, till the year 843, and the power of the family of Somerled of Kintyre, for some time after that period, furnish undoubted evidence of a population vastly greater than the present. In a period still more remote, we find the *Attacotti* (who inhabited less than what is now called Argyllshire) making such a figure in the *Notitia Imperii*, and in the Roman armies, that Mr. Pinkerton infers no less than 10,000 effective men could be supposed to have attracted so much notice in those accounts as we find they do*.

* About the end of the 4th century there was one body of them in Illyricum, another at Rome, and the *Attacotti Honoriani* in Italy. *Ammianus Marcellinus* calls the *Attacotti* "a warlike race of men, formidable to all Britain."

In the first century, the inhabitants of Argyllshire, joined perhaps by a part of those of Dumbartonshire, were so numerous as to be able to resist the Roman legions under the conduct of the renowned Agricola. Tacitus informs us, that Agricola, in the fifth year of his expeditions, shipping his army in the Clyde, attacked nations till then unknown in that part of Caledonia which lies over against Ireland *. To have been able to resist so powerful an attack, is a most irrefragable proof of the power and number of the inhabitants at that time.

How the country could at that period maintain such numbers, is not difficult to account for. They attended more to the cultivation of the ground than is done at present in many parts of the county; they distilled none of their grain, into spirits; they exported none of their cattle, and they lived more frugally, and took but one meal a-day. Every possible encouragement was also given to population; for the great object with every chieftan then was, to have men. Now the great, the only object, is to have money. But those certainly mistake the way of accomplishing this object, who depopulate their estates. It is only by encouraging population, that the country can be improved, and manufactures and commerce established; without which no country can attain to any considerable degree of affluence or prosperity.

It deserves also to be considered, whether, in a period so eventful as the present, it would not be wise to cherish the small remains of that brave people who resisted the Romans, subdued the Picts, and shook off the yoke of the Danes?

* *Vit. Agricola*, XXIII. "The counties of Dumbarton and Argyll were the theatre of war in Agricola's fifth campaign. The inhabitants were so numerous, that for a whole summer they gave ample employment to the Roman army." *Macpherson's Introd.* The number of Agricola's forces on this occasion is not mentioned; but at another period of the Caledonian war, under the same leader, they seem to have consisted of three legions, and were probably the same at this time.

CHAPTER XVI.

OBSTACLES TO IMPROVEMENT.

THE principal obstacles to improvement have been occasionally noticed already, so that it is unnecessary to enlarge upon them now. It is enough just to mention a few of them.

Short leases, and much more no leases at all, as is sometimes the case, are obviously adverse to improvements. No man of common sense, on a short and precarious tenure, will set about any great or permanent improvement. Either the landlord must do these himself, or grant such leases as will reimburse the tenant, or the land must remain in its unimproved state. The unwillingness, perhaps in many cases the inability, of landlords to enclose and make other permanent improvements, which cannot be expected from tenants on short leases, is much against the improvement of the country. Servitudes, when they take place, are altogether incompatible with improvements. If the landlord exacts much service from his tenants, and employs them on his business when they ought to be engaged in their own, he cannot expect that they will either improve their lands or pay their rent.

Large possessions are also highly inimical to improvement. The man who occupies a thousand acres will hardly attend to the cultivation of one of them. What is waste must therefore remain as it is, and what was once cultivated must revert to a state of nature, if such possessions are not divided. By this system the tenant may be a gainer, but the landlord and the public suffer. The landlord's rent must soon be at a stand, instead of advancing gradually, as it would be if his lands continued to be improved. The public too will be deprived of the additional corn and cattle that might be fur-

nished from the improvement of those lands which lie in an uncultivated, and comparatively unproductive state. Every estate, perhaps every farm in the county, is capable of being brought to such a state of improved cultivation as would maintain, perhaps, double the men and cattle which it maintains at present. The system, therefore, which takes away from the public every hope of such improvement, is hurtful to the public interest *.

But the greatest obstacle to improvement, and the most serious evil to the county, and to the public at large, is the tendency of large possessions and sheep-farming to depopulate the country. Every system that is adverse to population is ruinous to a country. No improvement can be carried on without hands; a depopulated country must ever be a wilderness. Let sheep be encouraged, but let the people be cherished also. Keep these, and they will improve the ground, so as to make it capable of feeding more sheep as well as more men. Encourage them to manufacture the wool, and they will enrich the country. Sheep-farming and population, though now considered as incompatible, might easily be made to give mutual aid to each other †.

The little encouragement given to cottagers, who in many places are hardly tolerated, even on arable farms, is a great obstacle to the improvement of the country. Cottages are the seed-beds of labourers and servants for the improvement

* From the quantity of various kinds of animal and vegetable food required to make a sufficient meal for one person in good health, and from the number of such meals in the produce of one acre, it has been computed, that for every one meal of butcher's meat produced by one fertile acre consumed by cattle or sheep in pasture, it would produce 12 1-half if occupied under good corn-crops; and 77 1-half if occupied under potatoes. The application of arable lands to grazing must, therefore, be highly detrimental to the public interest; as it will not furnish, under grass, the 12th part of the food which it would do under corn. See *Monthly Review*, XXIV. 410.

† See Chap. XIII. Sect. 2.

of the land, and of sailors and soldiers for the defence of the state. Policy, as well as humanity, calls loudly on the landlord to attend more to the cottager*.

Too high rents are on many estates the principal obstacle to improvement. Landlords consider high rents as a spur to improvement; and some have applied it so freely as to make the galled sufferer first exert all his strength, and then sink in despair under the burden. When the horse falls, the rider is apt to suffer. Landlords should be at pains to know the real value of their lands, and they will always find it safer to keep below than to exceed it. If the tenant is distressed, he can have neither the spirit nor the power to improve.

The common mode of letting lands to the highest bidder, by private offer, is also adverse to improvement. The most honest, able, and skilful, are unwilling to supplant a neighbour, and cautious of risking what they have already got, by casting their lot into this dark mysterious urn: whereas, the unprincipled, the indigent, and the ignorant, who have neither character nor substance to lose, are always found to be the most forward. Some landlords however say, perhaps justly, that they have no other way of judging of the value of their property. But they take too much for granted, if they think the persons who offer are always better judges than themselves.

The want of skill, and of a proper system of husbandry, and particularly the neglect of green crops, operate against the improvement of the country, as also the general poverty of the smaller tenants, where they hold their possessions in *run-rig*, as skill and capital are no less necessary to improvement than industry. But skill, it is hoped, will soon be obtained by means of the general attention now paid every where to agricultural inquiries; and skill, with industry, will soon increase the capital of the farmer, if the landlord will give due encouragement.

* See Chap. IV. Sect. 1.

The little attention hitherto paid to manufactures is much against the improvement of the country. Should we manufacture our own wool, and raise hemp and flax, and work them into sail-cloth, cordage, and linen, riches would find their way to us, and improve the country ; which is the usual consequence of manufactures.

The letting of farms to persons who do not reside upon them is much against the improvement of the country. A tenant who resides will always be doing something towards the improvement of the farm ; but he who plants it only with a herd or cottager will do nothing. A farm under this management is entirely left to nature, and must therefore remain in the state in which it is.

But it is still a greater evil to let farms to such as take them for no other purpose but to sublet them to others. These intermediate tenants are like the drones in a hive ; they live upon the labour of others, and often beggar those beneath them, as well as intercept the advantage due to those above them. If the profits which are enjoyed by these people for doing nothing were divided, as they ought, between the labouring tenant and the proprietor, the first might be at his ease, and the last have a considerable accession to his income. A humane landlord should not put it in the power of any man to distress the poor upon his lands, and a wise landlord should not allow another to reap the advantage which is justly due to himself. And yet it is no uncommon thing for one proprietor to let some of his lands to another, while that other will neither occupy these, perhaps, nor much of his own. Both these systems are adverse to the improvement of the country. A subtenant paying a racked rent, and having seldom any lease, has neither strength nor spirit to improve ; and if a proprietor makes any improvement, it will be on his own lands, and not on those which he rents.

The salt laws, with the many oppressive regulations con-

nected with them, are in the highest degree adverse to the industry and prosperity of a great proportion of the inhabitants of this county, and of course to the improvement of the country. It is impossible that, under so good a government, this shall continue long to be the case.

Scarcity of timber, the want of more commodious and comfortable houses, and better implements of husbandry, are all of them circumstances unfavourable to improvements; but the tendency to better things which already begins to appear, gives every reason to hope we shall make rapid progress.

A prejudice in favour of a coarse-woolled breed of sheep is in many respects unfavourable to the country: the wool brings less money, and the more valuable native breed is neglected, and in danger of being lost. Nothing could be of more importance to the county than to preserve and improve its native breed of horses, cows, and sheep, all which are capable of being brought to great perfection, and better adapted to the county than any other that have been, or perhaps can be tried.

Of all the obstacles to improvement none can be greater than the non-residence of many of the heritors, which deprives the ground of almost any part of the rent being spent on the premises. If a farmer should sell all the straw or dung which should manure his farm, it could not be more hurtful to improvement than the landlord's spending all his rents elsewhere. Two thirds, at least, of the rent are spent out of the county.

The intolerable number of dram-houses, which destroy the time, the morals, the means, and the health of the inhabitants, is also adverse in the extreme to industry and improvement. Landlords are in no respect more blind to their own interest than in tolerating so many of these baneful nuisances. They think that the farmer, by means of them, gets a better price for his bear; but it were better the bear were cast into the

sea, than to have it thus converted into a deadly poison to the industry, morals, means, and health of the people. If the publican is thus enabled to pay a trifle of rent, it is at the expence of 50 or 100 of his neighbours, and ultimately at the expence of the landlord. The tenant might raise oats instead of bear, and the meal would always find a market; or he might raise green crops, and add to the number of his cattle. By this change, the tenant, the landlord, and the country, could be gainers.

Among the great obstacles to the prosperity and improvement of this county, though not peculiar to it, may be mentioned the unhappy frequency of our wars. It may be computed that, between soldiers and sailors, every war drains this county of between 3000 and 4000 of its most active and able hands, the support of thousands more. In comparison of this, how trifling are all our other losses by emigration! Happy would it be for the natives of Europe, if some general court could be established, in which all the quarrels of its ruling powers could be adjusted by delegates, who should sit as judges, and finally determine every contest by their decisions, without the dreadful and shocking appeal to the cannon, the bayonet, and the sword. How must future ages be astonished at our madness, when the happy time shall come, in which *there shall be war no more!* In the mean time, while we are attacked, it is necessary to defend.

CHAPTER XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. I.—*Agricultural Societies.*

ONE has been lately instituted in Kintyre, and favoured by the President of the Board of Agriculture with a parcel of agricultural reports, which are read with avidity, and may be a means of diffusing knowledge of useful facts, and exciting attention and a spirit of inquiry.

It might be of service to have such a society in every parish, every member paying a small annual subscription, to be applied solely to the purchase of useful books on agricultural subjects: And as the minister of the parish is often (what perhaps he ought not to be) a farmer, it might be of service, if at a slack season of the year, he would give a few weekly lectures on agricultural subjects, arranging and digesting the most useful hints and improvements that come to light from time to time, so far as they suit the place and people of his charge. Those who cannot read themselves, nor perhaps afford the expence of a subscription, might thus be benefited, and a general spirit of improvement be diffused.

In every county there might be some person connected with the Board of Agriculture, who might receive, digest, and communicate, any important facts or useful discoveries that might occur in the county, and note down, from time to time, in tables, the measurement of any lands that may be surveyed, the rise or fall in their price, rent, or produce; the changes in the mode of living, price of labour, management of land or cattle, change or improvement of breed, with any

other particulars that might lead to make the Agricultural Reports, in time, more perfect than it was possible to do in the first attempt.

SECT. II.—*Weights and Measures.*

IN this county, as in other parts of the kingdom, the weights and measures are various, in various districts. At Inveraray the boll of meal is eight stone Scotch Troy, or Dutch; 17 1-half lb. avoirdupois to the stone. At Campbelton it is 10 stone, of the same weight; or 16 pecks of 10 lb. Scotch Troy, or 10 lb. 15 oz. avoirdupois, each.

In some parts of Knapdale and Lorn, the boll is nine stone; and dry measures vary in these parts nearly in the same proportion.

At Inveraray, oats, barley, and malt, are measured by a firloft of 3438.183 cubic inches; equal to one firloft, two pints, one mutchkin, Scotch standard measure; which makes the boll (of four firlofts) 7.258 per cent. better than the Scotch standard measure, and equal to six bushels one peck nine pints 10.2 cubic inches, English standard measure.

In Kintyre, oats, barley, or bear and malt, were for time immemorial sold by a heaped peck, of which the standard lay with the dean of guild in Campbelton. Of this measure 17 pecks made, and still make, the Kintyre boll from August to Patrickmas, and only 16 from that date to the new crop; and the divisions of the boll are regulated by the same proportions. As measuring by the heaped peck had been long considered as inconvenient and inaccurate, it was agreed on in the year 1782 by the heritors of the district, justices of the peace, and magistrates of the borough, that the heaped peck should be converted into a striked one, which should contain exactly the same quantity. This was accordingly done with great care and attention, and the new

striked peck, corresponding to the old, was committed to the dean of guild, and has been since the standard of the district. The dimensions of it are 12 English inches diameter, equally wide throughout, and 10 1-tenth English inches deep. The contents of it in cubic inches are 1142.28576 *; which makes the Kintyre boll 19418.85792 cubic inches, before Patrickmas, and 18276.57216 after it †. The first is equal to nine Winchester bushels and 65.03112 cubic inches (about $\frac{1}{3}$ of a bushel), and equal to one boll eight pecks 1.61788 lippie, Linlithgow standard measure. The latter is equal to 8 1-half Winchester bushels ‡, excepting 2.0394 cubic inches, and to one boll 6 pecks, 3.166 lippies, Linlithgow.

At Inveraray, the peck of potatoes contains 14 pints and one mutchkin, ale measure. At Campbelton, it contains about nine English wine gallons, and is given heaped; and generally weighs about 56 lb. avoirdupois.

Beans and pease are sold in Kintyre by the old peck striked, or by a measure one third less than that for oats and bear. Lineal and liquid measures are the same with the Scotch standards. Butter, cheese, tallow, hay, wool, and lint, are sold by the stone of 24 lb. avoirdupois. Butcher meat by the pound of 24 ounces avoirdupois at Inveraray, and of 16 ounces at Campbelton. The herring barrel contains 32 English gallons of wine measure, or 67.28 customary ale pints of 109.866 cubic inches each.

The inconveniences, occasioned by such a diversity of weights and measures as prevail over all the kingdom, are so many and so great, that it is astonishing how they have been

* Equal to 11 Scotch pints, and a very little more than two thirds of a gill.

† A lippie more, or 1-64th of a boll, for town dues, is given with every boll delivered in Campbelton.

‡ The Winchester bushel contains 2150.42 cubic inches. The Linlithgow boll standard measure, 12822.096

so long endured. By one of the articles of the Union it is enacted, "That the same weights and measures shall be used throughout the united kingdom as are now established in England." Might not the sheriffs, justices, and magistrates, of all counties, districts, and boroughs, convert the weights and measures of all places under their jurisdiction to a conformity with these standards, and take every legal measure to enforce the use of them? Every person interested in giving and receiving by the old usages, would soon learn how much of the new would be equal to the old; and in a short time all would be reconciled to a change which would be attended with such happy consequences. The wisdom of our legislature will not surely allow the present confusion in these matters to be of much longer continuance.

As several counties in Scotland have published lately their resolutions of applying for an act of parliament, for having all kinds of grain, potatoes, &c. sold by weight, as in Ireland; it is hoped that such an act will be obtained, and be productive of much good.

By act of parliament (31. Geo. III.), the Winchester bushel should weigh—

					lb. avoird.
Of Oats,	-	-	-	-	38
— Barley,	-	-	-	-	49
— Bigg,	-	-	-	-	42
— Rye,	-	-	-	-	55
— Wheat,	-	-	-	-	57

In order to have a statistical view of the whole county, the following Table of the insular parts of it (which do not fall within the writer's particular province) is given along with the annexed Table for the continental part of it.

PARISHES.	Valued rent.			Real rent. L.	Population in		Increase in 40 years.	Supposed extent in sq. miles.
	L.	s.	d.		1755.	1795.		
3 Of Mull (including Icolmkill & Ulva,	744	11	10	7711	5281	8016	2729	425
1 Of Tyree and Coll,	280	10	3	3000	2702	3457	755	53
1 Of Jura and Colonsay,	286	18	5	1656	1097	1858	761	125
Lifmore (united to Appin),	268	13	0	2850	894	1121	227	15
3 Of Ilay,	739	18	8	8000	5344	9500	4156	370
1 Of Gigha and Cara,	133	15	6	750	514	614	100	13
Elan-muck, Rum, and Cannay *,	87	10	7	701	650	950	300	63
	2541	17	9	24668	16482	25516	9028	1063

From this and the annexed table for the continent, the whole county will be found to be,

Valued rent,	-	-	L. 12466	5	10
Real rent,	-	-	112752	0	0
Population in 1755,	-	61575			
Population in 1795,	-	74471			
Increase in 40 years,	-	12906			
Extent in square miles,	-	3800			

* These lie in the parish of *Small Isles*, but belong to this county. The population of that parish in 1755 was 943, of which 650 may be placed to these islands. In 1768 Elan-muck contained 172, Rum 302, and Canna 233; in all 707 souls. *Stat. Acc. of Small Isles*.

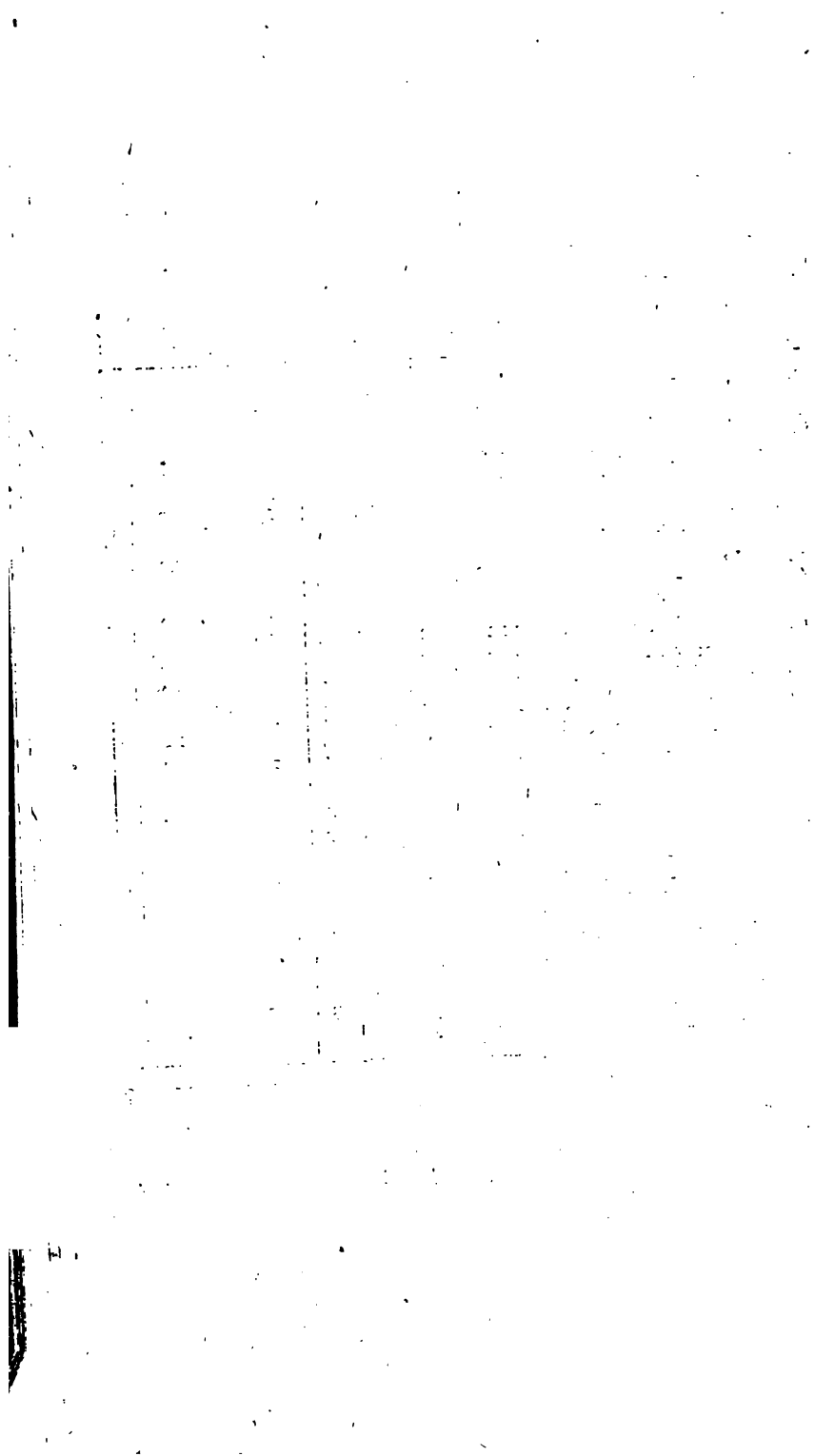
[To face Page 304.]

ARGYLLSHIRE.

No.	PARISHES.	Achs.	Sheep.	Length in Miles.	Brdth. in Miles.	Contents.	
						In Square Miles.	In Scotch Acres.
1	Southend, - -	720	3800	10	5	50	25000
2	Campbelton, -	510	2100	12½	7	87½	43750
3	Killean and Kilchenzie,	085	4926	15	3½	52½	26250
4	Sadale and Skipnefs,	378	4520	23	3	69	34500
5	Kilcalmonel and Kilbrannich,	237	5187	20	3½	70	35000
6	South Knapdale,	930	8500	15	5½	83½	37500
7	North Knapdale,	200	1400	12	3	36	18000
8	Kilmartin, -	800	6000	11½	3	34½	17250
9	Glaflarie, -	200	12000	15	10	150	75000
10	Craignish, -	903	1130	7	2	14	7000
11	Kilbrandon and Kilbrannich,	000	700	10	2¼	22½	11250
12	Kilninver and Kilmelford,	500	7000	8	8	64	32000
13	Kilmore and Kilbride,	100	6500	6	7	42	21000
14	Ardchattan and Muckhart,	700	30000	20	15	300	150000
15	Appin (united to Lifford),	500	24,000	50	9	450	225000
16	Morven, -	500	14000	18½	6½	120¼	60125
17	† Ardnamurchan (part of),	789	17000	28	4½	126½	63250
18	Kilmalie (part of),	920	20000	20	6	120	60000
19	Glenurchay and Inishowen,	454	26000	24	7½	180	90000
20	Kilchrenan and Dalawney,	940	8560	12	8	96	48000
21	Inveraray, -	160	7500	16	3¼	52	26000
22	Lochgoilhead and Kilbrannich,	120	26500	25	11	275	137500
23	Strachur and Straloch,	821	12280	18	4½	78	39000
24	Inverchaolan, -	400	14000	8	3	24	12000
25	Kilmodan or Glendaruel,	000	5500	10	2¼	22½	11250
26	Kilfinan, -	965	5746	15	4½	67½	33750
27	Dunoon, -	200	15000	24	2	48	24000
		332	290349			2735½	1367625

Penny lands.

In Dr. Webster's Report, rest of the parish lies in the county of Inverness.



Observations on the Statistical Table for the Continent.

THE valued rent, as observed before, (Chap. II.), was fixed in 1751, and was then half the real rent, after deducting public burdens *. As the real rent is now to the valued, nearly as nine to one ; it follows, that the real rent is advanced about four 1-half times since that period, taking the whole continent at an average. The price of cattle in that period has risen nearly, though not altogether, in the same proportion. And though there are many complaints, sometimes well founded, of the rents being too high, yet it is certain that the people in general are in a much more comfortable situation than they were, and in a progressive state of improvement. They are better clothed, better fed, and better lodged, and the greater part of them enjoy the means of happiness in a degree unknown to former generations. They have therefore, in general, more cause to be contented than to murmur : and, to do them justice, they are commonly more given to the first, than to the last of these dispositions.

After deducting the extent under water, and a third of the extent under wood (See Chap. I.), that proportion of it being generally enclosed, the average rent of the remaining ground is about 33l. 8s. per square mile, or 16d. per acre, taking only the continent ; but if the islands are included, it will be about 29l. 8s. per square mile, or 14d. per acre.

The column for proprietors exhibits the number in every

* The principal public burdens affecting the rents or land at present, are the cess, being 2s. 6d. on the pound of valued rent, and amounting, over the whole county, to 1558l. 5s. 8d. ; ministers stipends, and schoolmasters salaries, about 125l. to each parish (two of them, Inveraray and Campbelton, being double charges), which, at an average, contain above 100 square miles each ; road-money, being 1s. on the pound valued rent ; and a small assessment, under the name of rogue-money and fox-money.

parish, but the amount of it is considerably more than the real number, which is 156 (as in Chap. II.), many of them being proprietors in several parishes. In like manner, many of the number in the column of farmers hold possessions or farms in more than one parish, and fell to be numbered in each of them.

The next column marks the population in 1755, according to the returns then made to Dr. Webster. From comparing it with the present population in the next column, it appears, that in the last 40 years there has been an increase of 3872. This increase is owing to the greater population of the borough of Campbelton, and of the villages of Oban and Tarbert. The increase in these during the above period, is about 5000. The difference between this and 3872 above, shows that the country has in that time lost 1128 of its number. This decrease would be still more considerable, if we should deduct the additional numbers employed since in the slate-quarries of Eisdale and Balechellish, and in the mines of Strontian.

How different is the case, when we look at the Table for the insular part of the county, into which sheep-stocks are but now finding their way? The increase there is 9034; above one third.

Upon comparing the present population of the continent with its extent, it appears there are about 18 souls to the square mile*; but taking the whole county, including the isles, the number of souls to the square mile is about 19; which allows near 26 acres to each person, about two of them arable. The whole rent divided among the whole inhabitants, leaves about 30s. to each.

From the columns which state the number of paupers, and the annual funds for their relief, it will evidently appear that they are but miserably provided for. The pittance which falls

* Britain and Ireland, taken together, allow about 115 to the square mile.

to the share of each of them in the year (about 9s. 8d.), will hardly buy them shoes, if they should be able to beg. If there were no law in their favour, humanity alone should procure them more attention. The proportion of paupers to the other inhabitants, is nearly as one to 50.

From the columns for cattle, it will be found, that for one horse there are nearly six cows and 34 sheep. And, from comparing their numbers with the extent of ground (after deducting for wood and water, as before), it will be found that for one horse, six cows, and 34 sheep, there are at an average 157 acres; or nearly three 1-fifth horses, 19 1-fifth cows, and 109 sheep to the square mile. From this calculation, one should suppose the numbers in the Table to be too low; although much of the ground is no doubt of a very inferior quality, and much of it under a bad system of management.

The extent of the parishes is generally stated lower than in the Statistical Accounts, which seem not to have always made a sufficient allowance for the windings of roads, and irregularities of surface. Still the extent given in the Table may possibly be found to be fully high.

*Particulars respecting the different Parishes, chiefly from the
Statistical Accounts.*

1. *SOUTHEND* (or *Kilcolumkill* and *Kilblaan*)—is the most southern part of Argyllshire. About three-fourths of this parish (estimating by the valued rent) have been measured, and the proportion of arable to pasture found to be nearly as one to five. The possessions are generally moderate, lime is within reach, and a great deal of new land is brought into cultivation. There are few enclosures; no green crops but potatoes, and some small patches of clover. There are seven heritors, of whom none at present generally reside in it. It distils about 400 bolls of bear, and sends about twice as much to be distilled in Campbelton. It is bare of woods; but, if planted, they would grow well. The soil in general is good, and capable of great improvement. There are in this parish 319 families.

2. *Campbelton* (or *Kilkerran*, *Kilcouston*, *Kilmichael* and *Kilnivan* united)—affords much scope for agricultural improvement. More than half of it has been measured, and the proportion of arable to other grounds is nearly as two to seven. It has no woods; abounds in limestone, has some marl, shell-fand, and sea-ware. Campbelton was the capital of the Scottish or Dalreudinian kings, from Fergus the son of Erc, to Kenneth the son of Alpin. The town contains about five-eighths of the inhabitants in the parish. The chief branches of business carried on in the town, are distilling and the bus herring fishery. The first is profitable to the undertakers, but hurtful to the public; the last is advantageous to the public, but unprofitable to the undertakers. The state of licensed stills in this place was lately as follows:

No. of stills.	Bolls distilled.	Produce in gallons.
32	7634	26150

Of the above about 5000 bolls are reckoned to be the produce of the parish.

Of the fishing business in this place, the following is the average state of seven years preceding 1794. Since that time it has been rather worse.

Vessels.	Tons.	Men.	Barrels of herrings.
50 $\frac{1}{2}$	3004 $\frac{1}{2}$	674 $\frac{5}{7}$	7412

Every vessel, with her materials, is worth from 800l. to 1000l. Every fishing, from first to last, takes up commonly about four months; and it appears from the above, that only between 10 and 11 barrels fall to the share of each man, for the toil and expence, and risk of, such a period. His meat and wages, with the price of cask and salt, will generally amount to more than the whole value of his fishing; and the bounty (supposing it 30s. a ton, and well paid, which often it is not), is a poor compensation for the stock, risk, and charges of the vessel. Mr. Knox, in his history of the herring fisheries, gives a minute statement of the expences and returns of a fishing voyage; and finds the gain (after an outfit of 945l. 7s.) to be only 2l. 6s. 7d. It is astonishing that a business which experience, as well as calculation, shows to be unprofitable, is so long persevered in; and it is much to be regretted, that the largest capital employed in trade in the county (between 40,000l. and 50,000l.), together with about 800 (reckoning carpenters and coopers) of our most active and adventurous men, should be employed in so unprofitable a manner. Had this capital, and these hands, been employed for 40 years past in commerce, manufactures, and agriculture, the gain to the adventurers, and to the county, must have been very considerable. This business, however, is of advantage to the state, as it is a nursery for seamen, and as all that is gained from the sea is so much clear profit. The duty too upon the materials which they use, is so much added to the revenue; and the employ which the fisheries

give to people in the various other branches of trade connected with them, such as coopers, ship-carpenters, blacksmiths, joiners, blockmakers, spinners, netmakers, sail and rope makers, &c. is so much gain to the community.

3. *Killeen and Kilbenzie*.—In this parish, of which a considerable part has also been measured, the proportion of arable to other grounds is computed to be nearly as one to six. It sows about 2131 bolls of oats, 302 of bear, 28 of beans, 20 of pease, 531 of potatoes, and 16 of flax-seed. Ploughs 174, carts 292. Distillers three, publicans seven. Seldom any residing heritor. Little lime, much sea-ware, a patch or two of black wood.

4. *Sadale and Skipnefs*.—This parish sows about 15 bolls of oats, one of bear, and four of potatoes, for each merk land, at an average. Employs about 300 men in the boat-fishing, during the herring season. Each makes from 6l. to 15l. or sometimes 20l. in the season, according to the attention bestowed, and the abundance or scarcity of herrings. In this parish there is some planting, and a considerable quantity of natural wood; some of it not so well cared for as it ought. There are several old buildings, one vitrified, and the ruins of a monastery.

5. *Kilcalmonel and Kilberry*.—This parish sows 1671 bolls of oats, 195 of bear, 480 of potatoes, 12 of flax-seed. Has six buffes, 30 boats, 76 carts, and 143 ploughs. Turnips have been sown in this parish for some years; also some beans, cabbage, and clover, but to no great extent. The average return of oats two 1-half, of bear six, of potatoes ten; or, from the acre, two 1-half bolls of oats, four 1-half of bear, and 20 of potatoes, Kintyre measure. There is a considerable extent of wood.

6. *South Knapdale*—is mostly rough and mountainous; has several woods, one of them so old as to be for service in ship building. The arable part, though not extensive, is capable of much improvement. But the greatest part of the parish is better adapted for sheep than for tillage.

7. *North Knapdale*—has a considerable proportion of arable ground (though the general appearance is hilly), as may be judged from the teinds having been valued, in 1629, at 262 bolls, with 181. Sterling of money.

8. *Kilmartin*—has a large proportion of good arable soil, and a vast quantity of waste land, which is capable of improvement. Of one estate, consisting of 3822 acres, 1026 are arable. In this parish there are 42 ploughs, and only 12 carts; though a great deal of the arable land is plain. This single circumstance may serve to show the tardy progress of agriculture.

9. *Glassarie*—is partly under sheep, partly in tillage. The rent of above 200 of the tenants in this parish is under 30l. each. There are about 40 more, who pay each from 30l. to 250l. About 30 boats are occasionally employed in the her-ring fishery, each manned with four people, who are supposed to clear each from 20l. to 25l. a season.

10. *Craignish*.—In this parish five farmers pay above 50l. rent, and 48 are under that sum. There are 32 ploughs, and 38 boats.

11. *Kilbrandon and Kilebattan*.—In this parish there are 55 ploughs, and 80 carts. The returns are, from oats three to four, from bear five, from potatoes 8 to 16. The tenants on the principal estate in this parish (Lord Breadalbine's) are of

late restricted in the proportion of arable land which they are allowed to plough; by which they may be enabled to do their land more justice, and to reap better crops.

12. *Kilninver* and *Kilmelfort*.—The light plough with two horses, and without a driver, is generally used; and most of the farmers have carts. Of late, some of the low arable farms have been divided, each into three or four small farms, and enclosed. This measure has excited a spirit of industry and emulation, equally advantageous to the tenant and to the landlord.

13. *Kilmere* and *Kilbride*.—Two, instead of four horses, are now commonly used in the plough. The common returns are, from bear five to six, from oats three to four. Of 13 heritors, only four reside in the parish. There are from 15 to 20 sloops employed in the coasting and fishing business, and one vessel, above 250 tons, in the Baltic trade.

14. *Ardchattan* and *Muckairn*.—In this parish there are 53 ploughs, and 100 carts. The woods, at each cutting, bring from 15,000*l.* to 16,000*l.* In this parish lies the *Beregonium* of Buchanan. A wooden pipe, which conducted water to this place, was discovered a few years ago by a man who had been casting peats. *Stat. Acc.*

15. *Appin*—is united into one parish with the island of Lismore. A great part of this district is converted into sheep-walks, some of them of vast extent. One possession is from 18 to 20 Scotch miles long. Many parts of this parish are adapted for tillage, as well as for pasturage. It abounds in woods, natural and planted. A slate-quarry is wrought in it, and there are several appearances of lead-ore. The whole parish contains 3526 souls, of which 2405 are in Appin. In

1755 the whole parish contained 2812; of which, supposing the population to have been in the same proportion as now, Appin should contain 1918, and Lismore 894.

16. *Morven*.—Of 32 farms in this parish, 22 are mostly under sheep, and occupied by gentlemen and storemasters; ten are occupied by small tenants. Some of the larger possessions are from 5000 to 7000 acres. There are some large and valuable natural woods. During seven years that these woods were in cutting lately, it is computed that from 8000*l.* to 10,000*l.* were expended in the various operations of cutting, piling, burning, leading, peeling of bark, &c.: an immense advantage to the poor, as well as the proprietors. There are in the parish about 100 small fishing boats, and 14 or 15 of a larger size; one of them of 20 tons burden. About 70 tons of kelp are made yearly, at the expence of about 30*s.* per ton.

17. *Ardnamurchan* (with *Sunart*)—is but a part of the parish so called; the rest of it lies in the county of Inverness. It is for the most part hilly. The district of Ardnamurchan contains 276 families, and 1504 souls; Sunart 183 families, and 1038 souls. The rental in the table is exclusive of the return of kelp, mines, and woods. The kelp made yearly is about 60 tons; the present yearly returns of the mines are 300 tons, of which the proprietor gets 1-eighth in pigs, free of all charges. The woods occupy above 3000 acres, and yielded at last cutting, when many of them were old, 14,000*l.* The yearly average crops of the two districts are computed to be 400 bolls of bear, 1628 of oats, and 11,000 barrels of potatoes.

18. *Kilmalie*—is also partly in Argyllshire, and partly in Inverness-shire. In that part of it which lies in Argyllshire,

there are, besides the cattle mentioned in the Statistical Table, above 1000 goats. The whole parish contains 4031 souls; and, in 1755, it contained 3093: Of which, by the rule of proportion, 1067 should have been in that part of it which lies in this county, and which now contains 1100.

19. *Glenurchay and Inishail*.—mostly under the sheep system, like the other higher parts of the county. There are in it several natural woods, and some planting.

20. *Kilbrenan and Dalavich*.—Arable lands are divided into *infield* and *outfield*. The outfield is three years under oats, and three years ley. The infield is in four divisions, potatoes, bear, oats, oats or ley. A few gentlemen, however, are introducing a better system, and plough with two horses, without a driver.

21. *Inveraray*.—The woods and plantings about Inveraray are the most valuable and extensive in the county. The greatest attention is also paid, by the Duke of Argyll, to every agricultural improvement, and to the rearing of cattle. But the small tenants in this parish, as in other places, follow generally the old system. To this and the other parishes bordering on Lochfine, the herring fishing is of vast advantage.

22. *Lochgoilhead and Kilmorich*.—rough and mountainous, with a small proportion of arable land, and a considerable quantity of woods. It is mostly under sheep. There are three tenants in it, whose rent is above 200l. five above 100l. five above 50l. and the rest from 10l. to 40l.

23. *Strachur and Stralachlan*.—This parish sows about 312 bolls of oats, 104 of bear, and 126 of potatoes. Produce, 1092 of oats, 613 of bear, and 1512 of potatoes. About 100 bolls meal are yearly imported, but an equivalent is sold

in bear and potatoes. The parish is mostly under sheep. The rent of one farm is about 200l.; of several about 100l.; of some not more than 20l. About 1500 acres are under wood, and reckoned to draw about 6000l. when cut at the end of 20 years. The bark of the oak brings the greatest part of the money that is given for the woods. From 20 to 30 boats, each with four men, are occasionally employed in fishing herrings.

24. *Inverchaolan*.—Mostly under sheep, some of them of the Cheviot breed, which thrive well. The return of oats is from three to four; of bear from four to five. A gentleman farmer who follows the new system, with intervening green crops, has doubled this return; which cannot fail of inducing others to follow his example.

25. *Kilmolan, or Glendaruel*.—In this parish there are 24 ploughs, and 28 carts. The rent of the best arable land is from 15s. to 20s. the acre.

26. *Kilfinan*.—sows 765 bolls of oats, 111 of bear, 174 of potatoes. The returns of oats are stated above three; of bear above six; and of potatoes at 20; so that, after deducting the seed, there remains for consumption 1530 bolls of oats, 666 of bear, 3306 of potatoes. The bear is mostly distilled. In good seasons little is imported. There are 21 fishing boats, with four men to each. The fishing to each share from 10l. to 24l. and as much for the owner of the boat. This parish has 11 public houses, 86 ploughs, 58 carts.

27. *Dunoon*.—sows of bear and oats about 1000 bolls, which give above four returns, and from 150 to 200 bolls of potatoes, which give from 15 to 20 returns. The number of ploughs 85.

*Particulars respecting the Statistical Table for the insular parts of
Argyllshire, chiefly from the Statistical Accounts.*

Mull—is for the most part rough and mountainous. It is divided into three parishes, *Torafa*, *Kilninian*, and *Kilfineachan*, and *Kilviceuen* united. The parish of *Torafa*, called in the county-books *Torafa* and *Pennygown*, contains 1733 souls. In 1755 it contained 1012. Its valued rent is 208l. 2s. 4d.; its real rent above 2000l. Before the valuation it was divided into penny lands, of which it contained 56 $\frac{1}{2}$. This parish contains several woods, usually cut for charcoal: makes from 90 to 100 tons of kelp yearly. There are some red deer in its mountains.

Kilninian—is computed to be 12 miles long, and from 10 to 12 broad. Its valued rent is 329l. 3s.; its real rent about 3000l. The heritors are five, of whom two reside. The paupers vary from 70 to 100, and the yearly distribution to them from 12l. to 15l. Before the valuation it was divided into 109 $\frac{1}{2}$ penny lands, with 10 $\frac{1}{2}$ merk lands. Its population is 3281. In 1755 it was 2590. It is reckoned to contain 3000 black cattle (of all ages); 400 horses, and 4500 sheep. It makes from 170 to 180 tons of kelp yearly, at the expence of about 30s. per ton. The soil and climate of this parish, and of the whole island, are both very indifferent. The oats are mostly of the small black kind, of which more than two bolls go to make one of meal. The common return is three seeds. The fields are manured by folding cattle on them, and by shell-sand, after which four or five crops of oats are taken successively. The best land could not be long fertile under such wretched management.

The parish of *Kilfineachan* and *Kilviceuen* is computed to

be 22 miles in length, and varying from 3 to 12 in breadth. Its population is 3002; in 1755 it was 1685. The valued rent 207l. 6s. 6d.; the real rent 2711l. Before the valuation it was divided into penny lands, of which it contained $37\frac{1}{2}$, besides $3\frac{1}{2}$ merk lands. The oats are mostly of the small black kind. Sheep stocks have been lately introduced. The kelp made annually varies from 70 to 150 tons, as the price varies; the industry being in proportion to the encouragement. There is good free-stone in the parish, and several appearances of coal. There are six proprietors, of whom three reside. The number of paupers 60; the yearly distribution to them is from 5l. to 6l. In this parish lies Icolmkill (the property of the Duke of Argyll), celebrated for its monastery, founded by St Columba; which was for ages the seat of learning and of sanctity. Inch-Kenneth, celebrated by the classical pen of Dr. Johnson, in his beautiful Latin ode to it, lies also in this parish. Mull exports yearly about 1500 black cattle, exclusive of 500 which come first from Tyree and Coll.

Tyree and Coll.—Tyree belongs to the Duke of Argyll; Coll partly to the Duke of Argyll, and partly to Mr. McLean of Coll. Both have been measured and found to contain about 25,000 acres. Tyree is 11 miles in length, and above two in breadth; Coll, 14 in length, and near two in breadth. The valued rent of Tyree is 193l. 16s. 2d.; of Coll, 87l. 14s. 1d.; the real rent of both about 2000l. In Tyree there are 2446 souls, 1800 black cattle (of which 260 are yearly exported, and 70 killed at home), 600 sheep, 1400 horses (of a very small breed), 160 ploughs, and 270 farmers. In Coll there are 1041 souls, 1300 black cattle (of which 250 are exported, and 30 killed at home), 500 sheep, and 500 horses, 34 ploughs, and 97 farmers. In 1755, the number of souls in Tyree was 1509, and in Coll 1193. The paupers in Tyree

are 50, in Coll 34; the annual distribution to each is about 3s. Tyree makes 145 tons of kelp, Coll 55. Tyree abounds in fine marble, and has excellent fishing banks, and a great deal of dry warm sandy soil, the fittest, perhaps, in the kingdom for the cultivation of tobacco, if that were allowed. The general system of farming is extremely bad, and the returns are consequently very poor. Two men and two horses cut the sward with what is called the *rifle*, and then two men and five horses, with a plough, turn the fur. In a soil so generally dry and free, all this might be done by one man and two tolerable horses, by which the labour of two men and five horses might be saved for every plough. The oats are mostly of the small black kind; the returns are, from oats about two 1-half, from bear about four, and from potatoes in lazy beds five; in drills, sometimes 16 or more. Before the valuation, Tyree was divided into *marl lands*, of which it contained 1006; Coll into *merk lands*, of which there were 29.

Lismore—is about eight miles long and two broad; the soil is very fertile, lying mostly on lime-stone, and abounding in marl. It contains 61 merk lands. The rents are for the most part paid in kind, and personal services exacted by some of the landlords.

Jura and Colonsay.—This, in the county-books, is called the parish of Killearnadil and Kilchattan. The Island of Jura is computed to be 24 miles, and from five to six broad. It consists of 27 farms, of which 12 are in pasturage, and 15 in pasturage and tillage. It contains 204 families, and 929 souls. In the adjacent islands of Scarba, Lunga, and Belnahua, are 48 families, and 211 souls; most of them employed in the slate quarries of Belnahua. These, with Jura, make the parish of Killearnadil, of which the valued rent is 77l. 10s. 8d.

There are some red deer in the hills of Jura, and its sheep, of which many are of the old white-faced breed, have remarkably fine wool. In Colonia and Oronosa (or parish of Kilchattan), there are 134 families, and 718 souls. The valued rent is 209l. 7s. 4d.; the extent about 8000 acres, of which 3000 are arable. The parish of Kilchattan was divided into $27\frac{1}{2}$ merk lands; that of Killearnadil into 26 $\frac{1}{2}$.

Uay,—except one small property, belongs to Mr. Campbell of Shawfield. It is computed to be 24 miles long, and from 16 to 20 broad. It abounds in corn and cattle, and a lead mine has been long wrought in it. It exports yearly about 2000 black cattle, a considerable number of horses, and a great quantity of linen yarn. From the skill and attention of the proprietor, who resides here for some time every year, this valuable island is rapidly improving. Before the last valuation of the county, this island was estimated in *penny lands*, the amount of which made 220l. 6s. 2d. Scots.

Gigha and *Cara*—consist of 16 farms. *Gigha* was formerly divided into 30 merk lands, and *Cara* rated at 10s. 8d. Scots. There are four proprietors in the parish.

CONCLUSION.

UPON the whole, the principal improvements that promise to promote the best interests of this county, are such as have been specified at large in the course of the preceding chapters; especially the enclosing and draining of lands, the introducing of green crops, and of a proper rotation; the improvement of waste grounds, planting, and watering pasture and meadow grounds, building more comfortable and convenient farm houses and offices, attending more to the improvement of the native breed of cattle and sheep, or at least a better woolled breed than the black-faced kind*; as also encouraging improvements by leases of a proper length, and encouraging population; by giving moderate possessions to farmers, and proper accommodation to cottagers, and by encouraging fisheries, and introducing manufactures.

The rural economy, or agriculture of this county, cannot suggest many hints for the improvement of any other. Perhaps the thatching with heather roofs, as was observed to be the practice in some parts of this county, may be the most deserving of the attention of other districts, particularly in the Highlands†.

The writer cannot conclude his Report, without apologizing for unavoidable defects, and involuntary mistakes; for some such there must be, though it is hoped they are few and of little moment. Devoted to pursuits of a different

* The great advantages to be yet expected from sheep-farming, depend on our improving the wool, and manufacturing it at home. Attention in choosing the best tups and dams, and flocking the grafs lightly, will soon improve any breed.

† Some have been so sensible of the advantage of heather roofs, as to use them in the vicinity of Edinburgh. One or two of them may be seen at East Calder.

nature, he studied agriculture only as a relaxation, and practised it only on a small glebe. Sensible, therefore, of not being so well qualified as he could wish, for at least some parts of the task assigned him, he undertook it with hesitation, and performed it with diffidence. He acknowledges, with gratitude, the aid and encouragement which the Duke of Argyll, with his usual patriotic spirit, gave to the work, and the ready co-operation of his men of business, and of many other gentlemen, who, with the utmost alacrity, gave every information in their power. He regrets that all had not the like spirit, and that many gentlemen were absent in the service of their country, whose plans and surveys, could they be obtained, would have led to fuller information, and greater exactness. Had all the county been surveyed, and could these surveys be obtained, a statistical table for every parish, specifying the extent of every farm, with the quantity and quality of its different soils, together with the number of cattle and the rent of it, would be highly useful and satisfactory. On this minute plan, the writer at first proceeded, but for various reasons he was obliged to drop it, as he found it could not as yet be accomplished.

The greater part of this county being only in the infancy of improvement, a minute detail of practices which are given up in other parts of the kingdom, where improvements have made greater progress, would be of little service. The writer thought it, therefore, of more consequence to enlarge on those things which, in his opinion, ought to be done, than on some of those things which are actually doing. He hopes that many of the hints and improvements in agriculture which he has suggested may be of use in the present state of the county. The better to recommend them, he has frequently illustrated them by giving examples of their beneficial effects in other parts of the kingdom; and he can add, that his own experience, so far as it goes, corresponds to

those examples, and enables him to recommend the most of those improvements with the greater confidence in their utility.

In order to bring a work of this nature, on any future occasion, to greater perfection than can be done at once, it is much to be wished that intelligent gentlemen and farmers would keep an accurate account of any experiments which they make in their different lines, as breeders of cattle, or improvers of land; with any hints which their observation or experience may suggest for the improvement of the country.

This would be satisfactory to themselves, and might be useful to the public. The writer of this, feeling himself the want of such aids, heartily wishes that any who may take up the business again, may, in addition to his labours, be fortunate enough to have the assistance of such useful materials. To that business from which all derive their subsistence, all should, if possible, contribute something.

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THE END.

1. The first part of the document is a list of names and addresses of the members of the committee.

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